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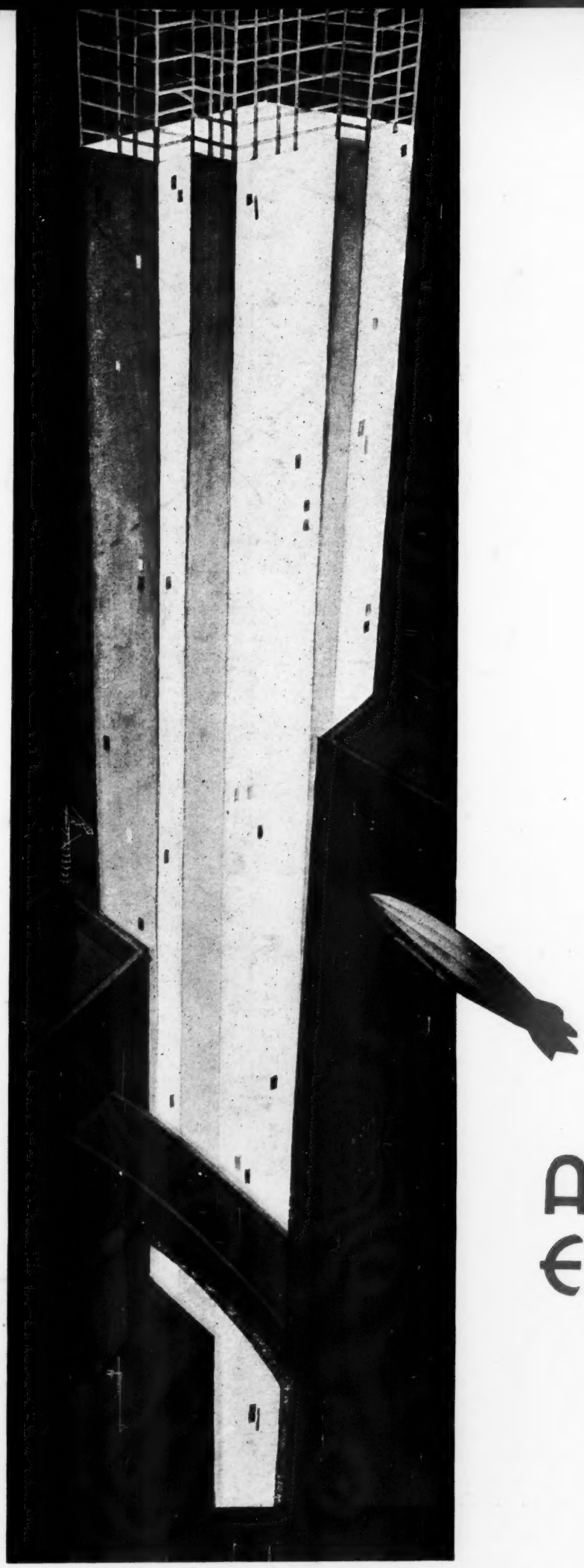
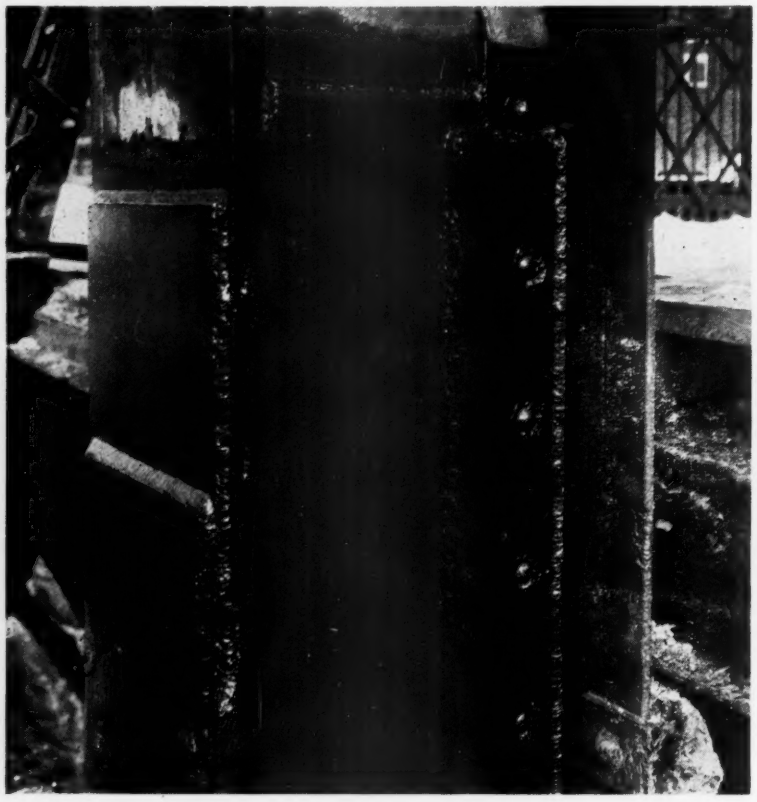


The AMERICAN ENGINEER

FEBRUARY - - - 1933



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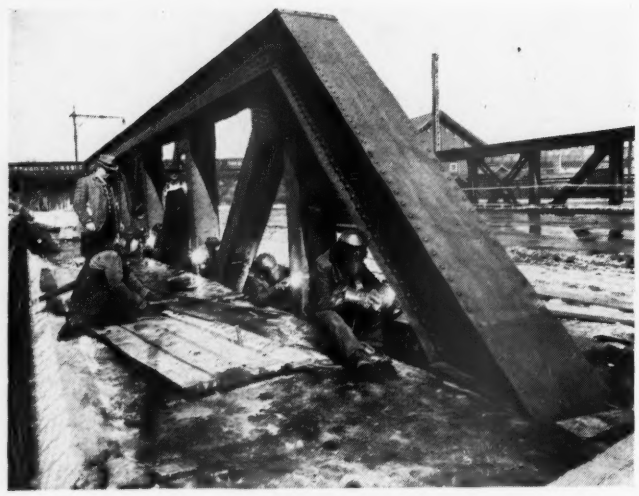
Safe Economical Bridge Repairs

Trusses and floor system of this concrete deck parkway bridge were in urgent need of repairs. By our application of structural welding methods, repairs were completed at low cost, and without removal of the deck.

NO TRAFFIC INTERFERENCE!



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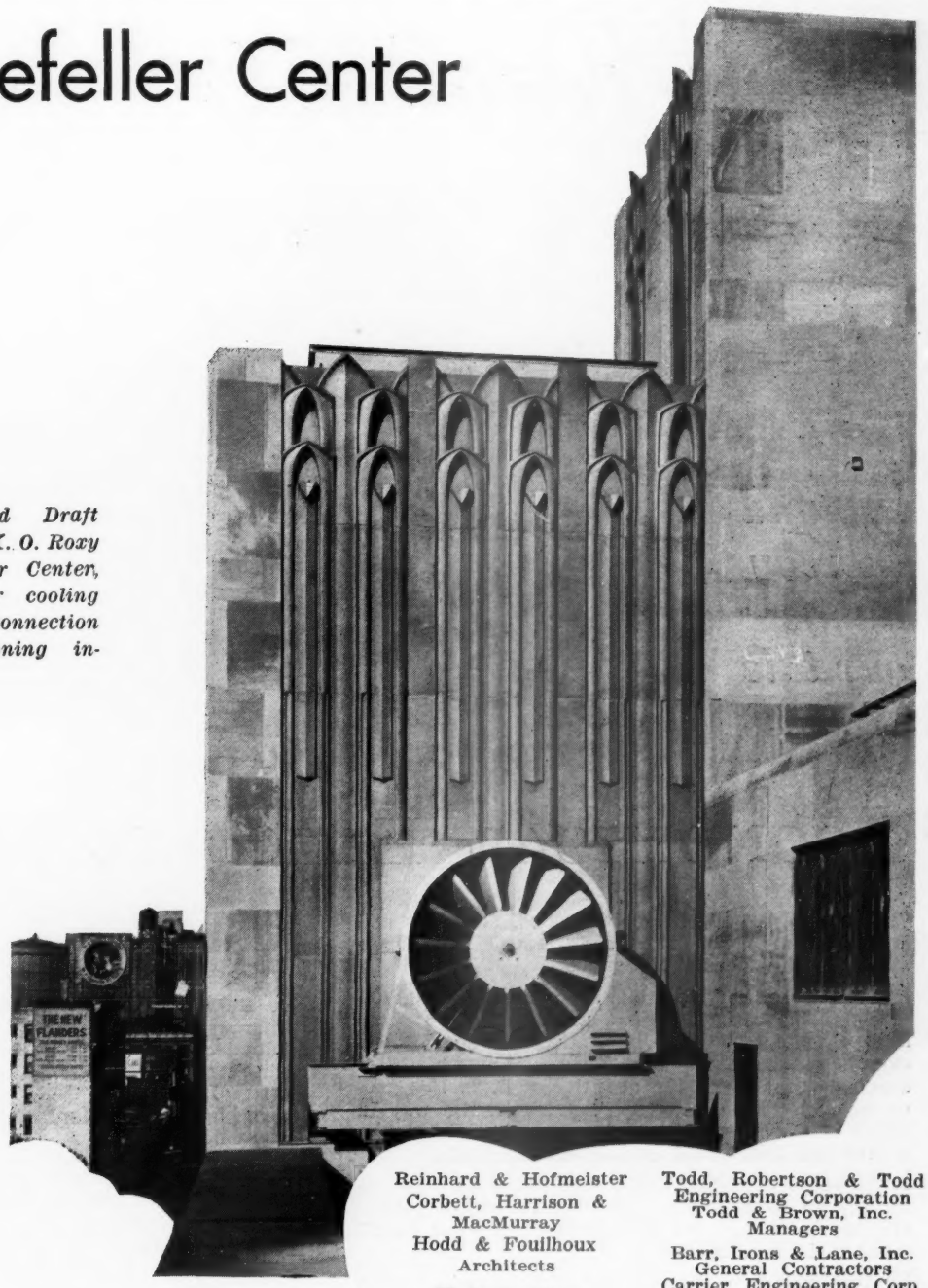

Ornamental Forced Draft Cooling Tower. R. K. O. Roxy Theatre, Rockefeller Center, New York. Tower cooling 500 G. P. M. in connection with air conditioning installation.

Reinhard & Hofmeister
Corbett, Harrison & MacMurray
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Architects

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Consulting Engineer

Todd, Robertson & Todd Engineering Corporation
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Managers

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Air Conditioning Contractors

Nearly two hundred feet above the street on the Rockefeller Center R. K. O. Roxy Theatre, this forced draft cooling tower will cool 500 g. p. m. of water in connection with the air conditioning equipment installed by Carrier Engineering Corporation. It is one of two similar towers placed at each end of a set-back on the 49th Street side of the building.

We are supplying ten cooling towers for the various buildings at Rockefeller Center, two of them of the induced draft type, the rest of the forced draft type. Each tower has been designed to form part of the building structure and to conform with the architectural details.

We frequently cooperate with engineers and architects in designing cooling towers to conform with their requirements as well as to meet rigid performance guarantees. We shall be glad to supply detailed information on our forced and induced draft cooling towers, atmospheric types, and spray nozzle cooling systems.

THE COOLING TOWER COMPANY, INC.

13-15 JOHN STREET, NEW YORK

Inside this Cabinet are 27 Copper Chimneys

. . . and thereby hangs our tale of . . .

DUCT STANDARD MODEL

This radiator is 27″ long; 23″ high and 7″ wide. Weighing only 42 lbs., it is easily portable.
Operates on 110-115 Volt A. C. or D. C. circuits. Using 600 Watts on "Low" and 1200 Watts on "High," it may be plugged into ordinary convenience outlets.
Finished in mahogany or jade green.

Prices:—

$32.50
(Equipped with Manual Control).

$53.50
(With Thermostatic Control attached).

"ECONOMICAL ELECTRIC HEATING"

There is no denying the convenience, flexibility and low installation cost of Electric Heat. High Operating Cost has been the bugaboo.

A Formula of Physics tells us point blank that a given amount of Electricity converts into so many B. T. U.'s—no more—no less. Common sense, however, suggests that the Effectiveness of an Air Heater depends not only on the quantity of B. T. U.'s generated but also, to a great degree, on the way in which the generated heat is discharged from the heater and distributed throughout the room.

From years of thought and experimentation to materially increase Heating Effectiveness through more efficient Discharge and Distribution came our DUCT ELECTRIC RADIATOR.

Externally it is a graceful and finely finished piece of furniture. Inside, you find an interesting, utterly simple Chassis, embodying 36 sq. ft. of copper heating surface arranged in multiple-flue formation—the patented "DUCT PRINCIPLE"

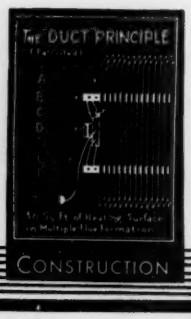
The sketches and descriptions below detail DUCT'S construction and operation. There are no fans or blowers—no moving parts at all, in fact, to require servicing or make a noise. The enormity of our heating surface plus the strong "flue action" of its patented arrangement accounts for DUCT'S amazing Effectiveness and consequent Economy.

A DUCT RADIATOR, using only 600 Watts, discharges the air at about 120°F; whereas an identic "ductless" heater, using 1200 Watts, discharges the air at only 130°. Our DUCT RADIATOR, switched up to 1200 Watts, discharges the air at 160°. This striking comparative demonstration is made daily at our offices.

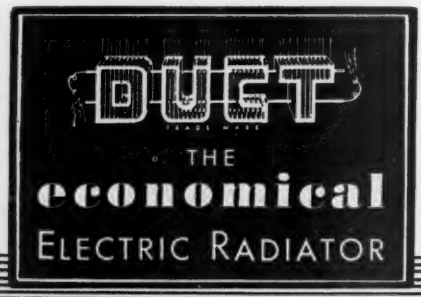
The practical applications of an effective, economical and portable Electric Radiator—which is simply plugged in and switched on—are many and varied. Almost any place that needs extra or timely warmth, independent of a central plant, suggests a DUCT installation.

Further information about our product may be promptly secured through reference to Sweets' Catalogue or by a request to us for literature.

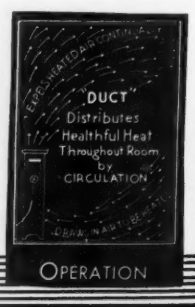
DUCT ELECTRIC HEATER CORP.
101 Park Ave. New York, N. Y.



LEFT: Sketch reveals construction of patented DUCT chassis. When switch (D) is turned to "High" or "Low," copper plates (A) are heated by electric elements (B). The air in "ducts" (C) is heated and rises rapidly.



RIGHT: Thorough and rapid heating causes strong circulatory effect. Heated air is uniformly distributed throughout the room without the aid of fans or blowers. Only Duct offers this patented principle and its significant results.



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NUMBER 2 FEBRUARY, 1933

TECHNOCRACY — WHAT IS IT?

Engineers Not Sponsoring Same

THE persistent and continual references by both commentators and press, to Technocracy as the endeavor of engineers to secure for themselves a place in the sun of civilization, is an unwarranted attempt to discredit the profession in the public eye. Both the sponsors of the movement who, in most cases in New York at least, violate the law if they profess to be engineers and the critics, who comprise in most instances the rear guard of a retreating and already discredited social order, are alike guilty of misrepresentation.

That Technocracy, whatever its eventual proposals may be, has not, at this writing, been sponsored or accepted in any manner by the engineering profession hardly needs affirmation in the face of the various theories that have of late been set forth by engineers. The American Engineer alone has in the last six months carried a dozen different proposals offered by its readers.

Why, one might justifiably ask, has the engineer received so little recognition from any of these and so much from a movement which at most has few legally recognized engineers amongst its advocates?

Recent developments indicate that a sorely distressed humanity is ardently seeking a solution to its pressing problem of equating overproduction and underconsumption or of affording every man willing to work the right to possess sufficient of the wealth of the world to enable him to live as a civilized human being.

Since the great war several social experiments have been put into operation. The most far reaching of these have been Fascism and Bolshevism. The success or failure of both of these is still a matter of bitter controversy in many quarters—the permanency of either remains to be seen. And now the world is growing concerned over the statements disseminated by a movement which, designated as Technocracy, appears to many to be another formula for solving man's social and economic problems.

Still in embryo it has brought forth tirades that have given to it a publicity unhoped for even by its exponents. To the attacks against may be attributed the impetus and probably premature recognition given to an undeveloped idea. No pronouncements of the last ten years have so disturbed the minds of Americans as have the statements made concerning Technocracy. Today it has become a center about which rage the storms of bitter criticism and vehement defense.

The dire predictions by its proponents, and the acrid criticisms by its opponents, have caught the popular imagination to the extent that it has become a household subject of discussion. The fervor of men's arguments oft times far exceeds their knowledge and to an interested and assumably intelligent observer the only apparent conclusions are that so far as a social philosophy is concerned the proponents have to date advanced nothing definite and that the opponents are consuming themselves in attacking what they read into it.

Seemingly, a bureau of so-called Technocracy has accumulated data covering a period of a hundred years, more or less, relevant to industry in America. Using these data as premises the said bureau has predicted that maintainence of the present economic system will produce certain results. At the same time, no tangible, practicable program has been developed for replacing the existing unsatisfactory (abused is a better term) social order. On the other hand, its opponents are seeking to out-talk one another in theorizing and doctrinizing upon findings and restricted predictions and ascribing to Technocracy elements, claims and proposals not pronounced by the bureau sponsoring the endeavor. Criticism of an idea, based principally upon the scattered statements of individuals or upon efforts to discredit one of its authors does not enlighten and so far as most persons are concerned places the critic in the position of him whom he would criticise. Of what concern to mankind, seeking a Utopian society, whether it be through the medium of Capitalism, Socialism, Bolshevism, Fascism, Fabianism, Fournierism or other social doctrine, is the private life of an Adam Smith, a John Stuart Mill, a Karl Marx, an Engel, a Lenin, a Mussolini or some other exponent of a theory for promoting the welfare of humanity.

It is the program which concerns society, that should be judged and not the training or lack thereof of the author as determined by his critics or by his eulogists.

Throughout the controversy the engineer has been the target of the critics of Technocracy. He

(Continued on Page 14)

SOCIETY WINTER MEETING

Albany—February 4, 1933

THE winter meeting of the Society took place at the Hotel Ten Eyck on February 4th. More than 150 representatives of the various chapters attended the afternoon session which was preceded by committee meetings and followed by a dinner in the main dining room of the hotel.

Legislation, the predicament of the engineer, diversion of State Highway funds collected from motor vehicle and gasoline taxes, unfair professional competition, Technocracy, Federal and State aid for engineering projects, proposal for planning and zoning commissions, state personnel reclassification, the creation of a Cabinet office of Public Works at Washington, pension rights of dismissed public service engineers, protection of the term engineer, reports, election of a nominating committee and various other matters pertinent to the welfare of the profession were presented, discussed and acted upon.

At the dinner in the evening Dr. F. H. Bosworth, professor of Architecture at Cornell University, Mr. A. L. Brockway, Secretary of the New York Board of Examination for the Registration of Architects and President of the New York State Council of Architects, Dr. Harlan H. Horner, Assistant Commissioner in charge of Higher and Professional Education, Kenneth Dayton, Associate Counsel for the New York State Society, Arnold G. Chapman, Vice-President, and Arthur V. Sheridan, Past President of the Society addressed the audience. Mr. E. E. Sheldon, President of Albany Chapter, welcomed the guests and members to Albany and presented President D. B. Steinman, who offered the opening address and subsequently introduced the several speakers of the evening.

Some of the more important resolutions are printed herewith. Copies of all resolutions will be forwarded to the several Chapters and to the persons and agencies concerned therewith.

RESOLUTION

Engineers Plight and Appeal for Investigation

WHEREAS, retrenchment in the matter of planning and executing indispensible and wealth producing projects is being made a policy, the objective of which purports to be the establishment of conditions permissive of increased employment, and

WHEREAS, such retrenchment augments the already alarming number of unemployed and has to-date given no evidence of approaching the desired objective, in fact appears to be preventing its accomplishment, and

WHEREAS, the engineer, whose contributions to civilization are primarily responsible for the necessities and conveniences of modern existence and for the material wealth of mankind, has been indiscriminately and in a disproportionate manner deprived of any means of livelihood, and

WHEREAS, practically every attempt at economy continues to result in discharging engineering and affiliated employees and curtailing the possibility of income of engineers engaged in private practice, whilst other employees of State, County and City are being retained regardless of curtailed activities in all fields of endeavor, and

WHEREAS, such policy and procedure are unfair and dangerous and are destroying the morale of the engineer corps throughout the public service and of the profession throughout the country, and

WHEREAS, in countless instances work ordinarily the function of trained, skilled engineers whose services are being dispensed with is being allotted to emergency employees furnished by Employment Relief Bureaus (to which the regular engineering employee has generously contributed) at salaries as low as forty cents an hour, and

WHEREAS, such policy and such methods, while not in any measure attributable to the emergency employee who, faced with starvation, is compelled to subscribe to the demands of self-preservation, are incompatible with American principles, have been condemned by every humane element of Society and would not be tolerated by a labor union, and

WHEREAS, maintaining, developing and planning those necessities and conveniences without which society could not exist, are even more essential than educating children or administering social problems, therefore be it

RESOLVED, that the New York State Society of Professional Engineers, in meeting assembled at Albany, New York, February 4th, 1933, does hereby protest against policies which indiscriminately sacrifice engineers upon the altar of false economy that will eventually produce chaos if permitted to continue, and be it also.

RESOLVED, that the said New York State Society does likewise appeal to the Government of the United States, the State of New York, the political subdivisions of the State of New York and to society in general to give attention to the dangers of a policy that is militating so harshly against a most useful member of society, and be it further

RESOLVED, that the New York State Society does herewith request legislative investigation by the Federal, State and Municipal governments into the condition of a profession whose plight is comparable to that of miners, farmers and other groups whose situations have merited and received investigation and recommendation at the hands of legislative bodies.

RESOLUTION

Technocracy and Engineers

WHEREAS, the various discussions relevant to Technocracy have in a measure, placed engineers in a somewhat false position, due to the professions of certain proponents and the condemnations of critics generally, and

(Continued on Page 20)

CANADIAN ENGINEERS POINT WAY

Codes Of Ethics And Minimum Fees Part Of Law

THE Code of Ethics and the Tariff of Fees established by the Corporation of Professional Engineers of Quebec are by official approval parts of the law regulating the practice of engineering in that Province.

The Corporation has its counterpart in the New York State Society of Professional Engineers. The Society should strive to bring to the profession in this State the control of its own affairs. Lawyers have long since placed the regulation and conduct of law in the hands of its practitioners.

The requirements and administration of engineering practice should be regulated by engineers.

The most essential part of a professional man's equipment is character, and violation of ethics, competition and unfair financial practices are dangerous and inimical to the public welfare and should be grounds for censure and disbarment.

CORPORATION OF PROFESSIONAL ENGINEERS OF QUEBEC

By Order in Council dated May 12, 1932, bearing No. 1136, His Honour the Lieutenant-Governor has been pleased to approve the following code of ethics respecting the Corporation of Professional Engineers of Quebec.

CODE OF ETHICS

1.—The engineer shall carry on his professional work in a spirit of fairness to employees and contractors, fidelity to clients and employers, and devotion to high ideals of courtesy and personal honour.

2.—He shall refrain from associating himself with or allowing the use of his name by an enterprise of questionable character.

3.—He shall advertise only in a dignified manner, being careful to avoid misleading statements.

4.—He shall regard as confidential any information obtained by him as to the business affairs and technical methods or processes of a client or employer.

5.—He shall have no interest, direct or indirect, in any materials, supplies or equipment used in the construction work of his client, or in any firms receiving contracts for his client's work, without in advance informing his client of the nature of such interest and obtaining his sanction.

6.—He shall refrain from using any improper or questionable methods of soliciting professional work, and decline to pay or to accept commissions for securing such work. He shall not compete with another engineer for employment by attempting to underbid after having been informed of the charges named by the other engineer.

7.—He shall accept compensation, financial or otherwise, for a particular service, from one source only, except with the full knowledge and consent of all interested parties.

8.—He shall not use unfair means to win professional advancement or to injure the chances of another engineer to secure and hold employment.

9.—He shall discourage the practice of calling for competitive tenders without sufficient plans and specifications.

10.—He shall not review the work of another engineer for the same client, except with the knowledge of such engineer, or unless the connection of such engineer with the work has been terminated.

11.—He shall co-operate in upbuilding the engineering profession by exchanging general information and experience with his fellow engineers and students of engineering, and also by contributing to the work of engineering societies, schools of applied science and the technical press.

The Council of the Corporation shall appoint a standing Committee on Professional Conduct, which shall include representatives of various interests, to administer the Code of Ethics. The duty of such a Committee shall be to interpret the code and to render opinions on any cases of questionable conduct on the part of members, that may be submitted to the Committee. These interpretations shall be reported to the Council of the Corporation who may take such action as may seem just and expedient.

The Committee on Professional Conduct shall be appointed for two years by the Council, and shall consist of five members, leaving office in rotation, two in one year and three in the next. The members of the Committee appointed in the first year shall decide amongst themselves which two members of the Committee will retire at the end of the first year following their election. The Council shall fill any vacancies that may occur for the unexpired term of any member who has withdrawn. The Committee after appointment shall elect its own chairman and secretary. The Committee shall have the power to secure evidence or other information in any particular case.

This Committee shall investigate all complaints submitted to it by the Council of the Corporation bearing upon the professional conduct of any member, and after the member involved has been given a fair opportunity of being heard, shall report its finding to the Council of the Corporation with its recommendations.

The Council of the Corporation shall have power to act on the recommendations of the Committee on Professional Conduct, either (1) to censure the conduct of the member who has acted contrary to the Code, if the breach is of minor character, or (2) to cause the member's name to be stricken temporarily or permanently from the roll of the Corporation.

(Continued on Page 14)

A Study Of The Registration Laws Of Other Professions

By D. B. Steinman
President, New York State Society of Professional Engineers

A STUDY of the practice laws of other professions is valuable in suggesting possibilities for the improvement of Engineers' registration laws. It is always helpful to know how others have solved similar problems. It is also well to be fortified with such citations when we are told that certain things cannot be done.

The following study is based primarily on the professional practice statutes of New York State, which (together with Engineering) are included in the State Education Law. (The practice of the Legal Profession is covered in the Judiciary Law and the Penal Law.)

(1.) Protection of the Professional Designation

Medicine: The State law governing the practice of Medicine provides that it shall be unlawful for any unlicensed person to

"(a) Practice or *advertise* to practice medicine; or

"(b) Use in connection with his name *any designation tending to imply* or designate him as a practitioner of medicine; or

"(c) *Use the title "doctor"* or any abbreviation thereof in connection with his name or with any trade name in the conduct of any occupation or profession involving or pertaining to the public health or the diagnosis or treatment of any human disease, pain, injury, deformity, or physical condition, unless duly authorized by law to use the same."

Note in the foregoing the inclusive and effective phrase: *"any designation tending to imply."*

The Medical statute further provides that:

"The display by any person of a sign or an advertisement bearing a name as a practitioner of medicine in any manner *or by implication* or containing any other matter forbidden by law *shall be presumptive evidence* in any prosecution or hearing of a holding out and of the practice of medicine by such person for each separate day such sign or advertisement is anywhere displayed by anyone. * * * * It shall be necessary to prove in any prosecution or hearing under this article *only a single act* prohibited by law or a single holding out or attempt without proving a general course of conduct, in order to constitute a violation."

Law: The practice of the Legal Profession is covered in the Penal Law, Article 24. This provides that:

"It shall be unlawful for any person * * * * *to assume, use, or advertise the title of lawyer,* or *attorney and counselor-at-law,* or *attorney-at-law,* or *counselor-at-law,* or *attorney,* or *counselor,* or *attorney and counselor,* or *equivalent terms in any language,* in such manner *as to convey the impression* that he is a legal practitioner of law or in any manner to advertise that he * * * has, owns, conducts or maintains a *law office* or law and collection office, or office of any kind for the practice of law, without having first been duly and regularly licensed and admitted to practice law in the courts of record of this state."

Accountancy: The statute for Certified Public Accountants specifies that it shall be unlawful for any person to

"Use in connection with his name *"any title or designation tending to imply* that he is engaged in the public practice of accountancy as a certified public accountant."

The statute further provides that:

"The display or uttering within the state of a card, sign, advertisement or other printed, engraved or written instrument or device bearing a person's name in conjunction with the words 'certified public accountant' or any abbreviation thereof * * * shall be *prima facie evidence* * * * that such person is holding himself out to be a certified public accountant. * * * *A single act* * * * * shall be sufficient to justify a conviction * * * * without evidence of a general course of conduct."

Architecture: The Architects' law in New York State is clear-cut and specific in protecting the title "Architect":

"In order to safeguard life, health and property, no person shall practice architecture in this state, *or use the title architect* or any title, sign, card or device to indicate that such person is practicing architecture or is an architect, unless such persons shall have secured from the regents a license as architect."

Nursing: The Nurses' registration law places the entire emphasis on *the protection of the title* and does not otherwise attempt to restrict the practice of nursing. The following are the essential provisions:

"Any person . . . . holding a diploma from a training school for nurses * * * * and who shall have received from the department a certificate of his or her qualifications to practice as a trained, certified, graduate or registered nurse, shall be styled and known and entitled to practice as a registered nurse, and *no other person shall assume such title,* or use the abbreviation R. N., *or any other words,* letters or figures to indicate that the person using the same is a trained, certified, graduate or registered nurse."

"Nothing contained herein shall prevent any person from engaging in nursing, provided, however, that he or she *shall not assume the title* of trained, certified, graduate or registered

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What The New York State Society Is Doing

Press Throughout The State Reports Its Activities

THE importance and development of the New York State Society may be appreciated from the fact that during the past two months more than one hundred newspaper clippings concerning it have been forwarded to the office of The American Engineer by interested persons.

Several are reproduced herewith:

A PROFESSIONAL GRIEVANCE

(Editorial on term "Engineer" by Syracuse Herald)

The Herald has received news of an organized movement of the New York State Society of Professional Engineers to protect themselves from what they evidently consider a widespread injustice. It is described by a single phrase—the misuse and abuse of the designation "Engineer."

The grievance of the State Society has been elaborated by its President, Dr. D. B. Steinman, in an address from which we cull the following enlightening extract:

The individual Engineer has invested many years of his life in professional education and arduous professional training in order to qualify as an "Engineer." The profession is investing decades of united effort to win public recognition and esteem for those who bear the title "Engineer." All of this investment is largely nullified if the use of the term "Engineer" is left unprotected. So long as the plumber, the radio mechanic, the insurance agent, the truckman, the fumigator, and others may freely appropriate the designation "Engineer" the effort to secure unique public appreciation of the Engineer is thwarted.

The dignity and respect that rightfully belong to the designation of a learned profession cannot be maintained when that designation is abused by indiscriminate misappropriation. No other learned profession tolerates the unauthorized appropriation of its professional designation. So long as any non-engineer may with impunity call himself an "Engineer," prefixing any random adjective (such as efficiency, domestic, sales, social, exterminating, amusement, radio, plumbing, real estate, decorating, etc.) the ignorant and prejudiced will retain an excuse to charge that Engineering is not a profession but merely a heterogeneous agglomeration of nondescript specialties. The term "Engineer" becomes meaningless, or an object of ridicule rather than respect.

Whatever else may be said of the earnest complaint and protest of Dr. Steinman and his associates, they must be deemed logical and natural from the viewpoint of professional pride. It is in that spirit of recognition that we opine that great difficulties lie in the way of any corrective process. One of these difficulties is traceable to the dictionary. For example, the Standard dictionary presents the following definitions of "Engineer": 1. One versed in practicing any branch of engineering. 2. One who runs or manages an engine. 3. A person who manages or carries through any enterprise. 4. An inventor, contriver or designer; also, a plotter.

It will be seen that this group of lexicographic interpretations is awfully comprehensive and elastic. Broadly construed, it would let in not only a leader in the engineering profession proper like Dr. Steinman, but the operator of any kind of engine, the manager of a salesman's drive, and also (save the mark!) a "plotter"—the last named term being a potential synonym for a resourceful and not over-scrupulous politician.

After surveying these meanings, we must hold them at best partly responsible for the phenomenal usurpations of the title "Engineer" which the State Society deplores and condemns. In saying this we emphasize an impediment which the Society will find it hard to overcome.

It may also be observed that when Dr. Steinman declares that "no other learned profession tolerates the unauthorized appropriation of its professional designation," he overlooks the medical doctors and the educational professors. They, too, have suffered from malappropriation, and the grounds for their grievance have not entirely disappeared.

Perhaps the State Society of Professional Engineers would take a long step toward self-protection by devising a more distinctive title applicable to their calling—a title, let us say, corresponding to "Doctor," "Professor" or "Colonel." No one would think of saying to a dignitary of the engineering profession, "How are you today, Engineer?" Such a title of honor would be flexible rather than specific. The dictionary appellation, as we have shown, is altogether too far reaching. If the members of the State Society could coin a title more indicative or narrowly definitive, it might serve as a solvent for their problem.

AN INVITATION FOR DECENTRALIZATION

(Editorial from the Mt. Vernon Argus)

Colonel Hoover of Yonkers, speaking Wednesday night before the Westchester Chapter of Professional Engineers, made the prediction that within a few years Westchester must be ready to receive business firms now in New York City, who wish to decentralize and establish their office buildings and headquarters in this county.

That is a novel idea. Westchester has long considered itself a residential area, with a limited quantity of industrial activities. The latter phase of development has never been eagerly sought,

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ENGINEER VERSUS SCIENTIST

Reviewed From The Standpoint Of An Engineer

A. P. FLAMANDS

IN publishing the article entitled "The Engineer Versus the Scientist" The American Engineer assumes no responsibility for either the statements made or the opinions expressed. The author presents a most instructive discourse and sets forth many data in support of his contentions.

These, in some instances, merit a response and the columns of The American Engineer will be open to any scientist, teacher of science or research worker who submits a worthwhile brief in reply to Mr. Flamands' argument.

A rejoinder is invited.

The writer, in developing his argument, has adhered to the following plan: 1st, a brief review of recent world discoveries and achievements; 2nd, a short commentary on the trend and import of the times, and 3rd, conclusions deduced from the events of the recent past.

The decade ending with 1932 has just drawn to a close, and it is fitting, at this time, that we pause for a moment and consider what progress has been made by the Engineer, on one hand, and by the Scientist on the other.

Recent advances in the general Electrical field are typical and marvelous examples of engineering progress. The generation of electrical energy in direct current dynamos, of relatively small output, has been revolutionized. Electrical energy is now obtained, for commercial purposes, from gigantic alternating current-polyphase machines which are so distributed that their electrical output suffices to meet the demands of mankind. Failures of electrical energy have become a thing of the past and we are now assured of a constant supply of electric current. All this is to the credit of engineers.

The discovery and nature of alternating current has been responsible, to a large extent, for our advancement thus far. The transmission of alternating current has been developed to such an extent, that the transfer of electricity commercially is now practical over hundreds of miles and our country has become a vast network of high-power transmission lines. It is probable, however, that this method will be replaced with high voltage direct current transmission soon. By reason of recent advances in the electronic fields, direct current electricity of high voltage may now be obtained and its use will increase the efficiency of our present transmission lines many times. In fact, a super-power system connecting the whole United States into one great central power system, is not far distant. We have already proven the efficiency of such a scheme by the power systems located about New York, Chicago, Pittsburgh, and other large industrial centers. Keeping step with these advancements in electrical generation and transmission, we have equal advances in its control, switching and protection. Today, we can connect generating systems, operate circuit interrupters, start and stop machines, regulate their phase, and segregate feeders—all from a remote point. Automatic generating stations are now operating in all parts of the country, to generate, transform, and convert electric power. They are guided solely by control devices, almost human in their performance. Protective devices are in operation which will take care of short circuits and abnormal conditions automatically.

Electrical engineers have, in fact, developed a new system of mathematics by which they are able to calculate the effects encountered in a polyphase alternating system; something impossible fifteen years ago.

The application of direct current transmission will have a revolutionary effect upon our present methods of transmitting, converting and controlling electricity, and will eliminate many types of costly and troublesome equipment. The mercury arc tube has been commercialized to the extent that it may be substituted for a large motor generator or a rotary converter, weighing many tons and costing thousands of dollars.

Without these rapid and revolutionary developments in power generation and power transmission, the tremendous strides taken by commerce and industry would not have been possible.

The development of telegraphy and its progress, beginning with a small hand operated key and electrical magnet or sounder, to the present day automatic tape and page printers, and devices capable of sending facsimiles or pictures to distant points, is a huge step. In fact, so highly developed has this become, that it is now possible to send a check by telephotography and have it honored. You may enter a Telegraph Office in San Francisco, if in need of funds, write a check on your bank in New York, and in a short time receive the money. Service, while you wait, over 3,000 miles of space—that is something to wonder about.

Engineers have developed the telegraph instrument to a point where it is now possible to send many messages simultaneously—all with the same circuit. Automatic printing systems are in use, which will send and receive as many as 1,000 words a minute. Telegraph messages are now being sent over busy telephone lines without interference to telephone conversation.

Conversations over local telephone systems may be held between distant countries. You can pick up the telephone from your desk at the office in the city, or from your home in the suburbs, and talk with anyone you desire in most any part of the world. Truly, this is a far cry from the local magneto party line service we can all remember.

Automatic telephone systems have been designed

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Cooperation Between Architects And Engineers

By Francis Lee Stuart

Past President of A. S. C. E.

THE following address was delivered on the occasion of an "Entente Fraternalle" Dinner given by the Architectural League of New York to three noted bridge engineers—Gustav Lindenthal, Ralph Modjeski and Othmar H. Ammann.

The Architectural League of New York is giving us the pleasure of discussing with you one of the greatest material advances of the present generation, the Long Span Bridge.

An occasion like this must stir the interest and appreciation of all members of both professions, for the dreams of the lives of our guests you are honoring have been made into facts.

The concentration of population and our insatiable wish for mental and physical comforts, and a growing value of time in our improved living conditions, have developed new problems for us to solve to meet the economic and artistic needs of the times we live in.

To meet such needs, there has been a rapid development in research and in recording and spreading our knowledge of materials and their uses with amazing results.

Of all amazing results I think the most outstanding advances in world progress during the last century is the Long Span Bridge.

When the cost of constructing these great structures, of which I speak, to meet certain demands of transportation was economically justified, the knowledge necessary for the building of Long Span Bridges was forthcoming, as a result of research and effort in many directions by many men, and these men have been the fortunate ones who have been privileged to devise and direct our accumulated knowledge and made our dreams come true.

They all three have been the builders of the Long Span Bridges of the world, which fire the imagination and delight the minds of Engineers and Architects alike.

These men who are your invited guests tonight, have by years of studious thought and effort been leaders in analyzing and solving the exact mathematical formulae of strains in large structures, and by scientific research for alloys and other improved materials to meet their needs have increased permanently the strength and adaptability of many materials for our use.

These accomplished works are of such a character that they furnish a new set of tools for us to work with and open wide vistas for us to explore in many directions. They and their works are the breeders of thought for future generations.

With our increased knowledge and skill to which these men have contributed such a notable share, we can expect that the Engineer and the Architect, in cooperation, will work out far greater advances in the future than in the past.

This is an Engineering Age and we are unraveling the secrets of nature and the mysteries of past ages and translating them for the uses of, and well-being of mankind.

In a broad sense, Engineering is that entire system of knowledge and skill which comprises all mechanical pursuits, physical forces and laws so far as they supply the material wants of men.

In seeking after scientific facts that can be verified for our use in such a broad field, the profession of Engineering is of necessity divided into many branches.

While the individual practices his special calling or branch only, he should have a real knowledge of the other branches of his profession in those aspects where he necessarily touches them.

It is not essential that an Engineer should know the orders and styles of architecture, but the practice of his profession should make him particularly sensible and susceptible to the uplifting influence of Art and the great necessity for it as a stimulant for the minds of men.

Architecture is a part of Engineering. While it includes the designing and direction of certain construction, its distinctive contribution is an artistic conception of the visible forms of construction, whereby our intellectual happiness is influenced and in a certain sense, in its higher capabilities, is a refinement of an important branch of Engineering and among the highest type of all professions.

The relations between the Engineer and Architect are largely the relations of Science and Art. They supplement each other and only by cooperation can we secure the best from both professions.

Many of the advances in the Sciences and Arts comprised in both professions are so recent that they have changed the old relationships, and the Civil Engineering and Architectural professions are comparatively modern, even though engineering and architectural pursuits have occupied the talents and energies of men from the earliest times.

Both professions were formerly practiced by the same person, but few men can now perform a useful purpose in both provinces, and the old race of such men will die out.

The two professions should be kept distinctly separate, but there is no reason why the natural bond between the two professions should not be respected and be drawn tighter.

Let the Civil Engineer and the Architect each stick to his last—this division of labor is essential to the greatest success and no great work should be undertaken without the union of the two.

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The Engineer As Umpire

By Alexander Haring
Attorney at Law
President Bronx Chapter, N. Y. S. S. P. E.

THE engineer in his time plays many parts. In turn he is designer, constructor, investigator, executive; but seldom in these more usual roles is he called upon for the nice discretion demanded of him as umpire.

The umpire's lot was ever a sad one. Yet ordinarily he is at least assumed to be without leanings which would tend to bias his judgment: the engineer on the other hand, while a faithful servant of one party, must often serve both interests as an impartial judge.

Custom sanctions the engineer in this role, but its manifest unfairness would appear in the outcry which would arise from the owner if the contractor should suggest the substitution of his own superintendent for that judicial position. His protest is evidence, if any were needed, that the use of an employee opens the door to fraud.

The engineer puts himself in this delicate position whenever, in writing a specification and contract to govern a piece of engineering work, he places in his own hands the power of deciding disputed points.

Before payments are made to a contractor, a monthly estimate or certificate must be obtained from the engineer and before final payment is made by the owner a final certificate of acceptance by the engineer or architect must be procured.

To all engineers the following paragraph is familiar:

"*Engineer as Umpire* (1) To prevent all disputes and misunderstandings in relation to any of the stipulations contained in this agreement, or their performance by either of said parties, the said engineer shall be and hereby is made umpire to decide all controversies arising or growing out of this contract, and his decision on any point or matter touching this agreement shall be final and conclusive between the parties. And it is further agreed between said parties that, wherever the word engineer is used, it shall be taken and construed to mean the chief engineer employed by said second party."

Often a controversy arising from this prerogative of the engineer is referred to the courts, where the engineer is allowed some judicial latitude. Indeed, within certain vague limits the engineer is sometimes sustained even though morally in the wrong. Basic legal principles establish that, if parties contract in this deliberate manner, they must abide by their agreement.

The contractor generally wants to get around the engineer's estimate and recover for work which he alleges he has done and for which the engineer has not allowed him. As a rule in order to avoid an engineer's estimate, a contractor must prove one of several things: fraud, failure to exercise honest judgment, or such gross error or mistake as to imply bad faith. In these instances, engineers' estimates, which are nothing more nor less than expressions of personal judgment as to amount of work done, have been set aside and justice meted out to the contractor.

The following occurrence of some years back illustrates this point:

For a distance of 38 miles along the Snake River in Idaho, a Washington construction company built the "Twin Falls Canal," the contract approximating $600,000. During the progress of the work differences arose between the engineer and the contractor over estimates and calculations of amount of loose and solid rock excavated, overhaul, plowing of land, pumping of water, riprap, etc. The contractor took what he could get but always under protest. Owing to a fancied grievance bad blood early developed between the contractor and the assistant engineer. One day the latter told the contractor that he was going "to do" him because he had had him fired from a Northern Pacific Railway job some months before. The contractor pleaded with the chief engineer about the assistant engineer's estimates but to no avail, so when the job was finished he filed a lien on the canal to secure his tidy claim of $185,000. How the judgment of this chief engineer appears from a legal view is well expressed by the court in the following words:

"Where the chief engineer of a defendant company, who has been selected umpire for the purpose of making a final determination of controversies and differences in reference to the work, material, measurements, and classifications, retains in his service an assistant engineer who is manifestly prejudiced and biased against the contractor, and where, after such chief engineer has been advised of the animus, bias, and prejudice of his assistant against the contractor, causes such assistant engineer to make the measurements, estimates, and classifications of the work done by such contractor and it manifestly appears that such estimates and classifications have been unfair and unjust, and discriminating against the contractor, the court when appealed to will set the same aside, and ascertain from the evidence submitted the true amount of work done or material furnished, and the proper measurements and classification thereof and order judgment accordingly."

In making monthly estimates it doesn't pay to dip the pen in bad blood. Even the appearance of grudge must be avoided for an inadvertent error in arithmetic might place an engineer in position where it would be exceedingly difficult to establish good faith.

There was another outcrop of this vein of dissatisfaction with an engineer's judgment on the Virginia Air Line. At the time, in Albemarle

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MAKE THIS THE LAST DEPRESSION

By Emanuel Lissner

(A Practising Engineer of San Pedro, California)

(Concluded from Last Issue)

So far I have pointed out that the current depression arose from our having multiplied our facilities of production beyond our demands as consumers, and that the funds for this overexpansion were derived from our collective thrift, which outran our collective spending. I have said that my preventive against future depressions is designed to end such overexpansion. It will force us to spend more of our funds for consumers' commodities. This will increase a consumption and, in turn, will justify a limited degree of expansion.

I shall now describe the process by which overexpansion develops. In doing so, I shall consider chiefly the acts of corporations, but much of what I have to say applies also to partnerships and to individuals in business. Corporations are merely aggregations of individuals. Some of their shares stand in the names of other corporations, but the ultimate owners are individuals. Thrift on the part of a corporation has the same effect as thrift on the part of the body of its stockholders.

A portion of the funds that corporations used in their programs of expansion is raised by selling additional securities, and a part is taken from their undistributed earnings or surplus. The sums derived from the sale of securities are the result of saving, and have been diverted from the purchase of consumers' commodities. The same is true of the money taken from surplus, since the corporations might have paid this to their stockholders, who would then have been enabled to increase their personal expenditures.

In order to follow the growth of overexpansion let us transport ourselves back to the year 1927 when business was neither so good as it had been in 1926 nor as it would be in 1928. During 1927, it is considered that we passed through a minor depression. Perhaps it would be nearer the truth to say that business was about normal. In that year the capacity of our plants was in advance of our requirements as consumers, but not dangerously so, except in a few lines of industry. Sales could be made without undue pressure, unemployment was relatively small, and the lessons of previous depressions had been forgotten.

It was a year when there was increased business for those who would go after it. Conditions were ripe for an era of overexpansion—and it set in. I am not scolding. I am not denouncing the American people as greedy and grasping. On the contrary, I hold it to be highly commendable that an individual should have tried to build up an income for his old age, or that a corporation should have sought to expand, so as to increase dividends for its stockholders and wages for its employees, and so as to afford opportunities of promotion for its officials, superintendants, and foremen.

New factories were built and old ones enlarged and modernized; new land was broken for crops, and fertilizer was applied to the old acreage, new oilfields were developed; new power lines were constructed. These developments held out a glittering promise of profits and gave employment to all. More and more money was saved to be put back into investments. The activity became feverish; and this condition prevailed through 1928 and part of 1929.

Such an overexpansion would have worked small harm, if it could have been confined to those industries which produce consumers' commodities. Any falling off in demand would have acted as a speedy corrective. But such industries stand at the ends of long lines of production which start at raw materials and continue down through a series of capital articles. The real mischief is that the overexpansion works back up the lines of production; and the further it goes the more intense it becomes, increasing by geometrical progression. All this pyramiding of productive facilities is brought to bear on the demand for consumers' commodities, a demand which certainly speeds up somewhat in times of prosperity, but which must fall over farther and farther behind the flitting heels of production.

To illustrate this pyramiding, I shall consider a single consumers' commodity, in this case bread. The consumption of this article is subject to little variation. Nevertheless, from 1927 to 1929, when business was on the upgrade, the bakers of the country were expanding their facilities by installing new mixers and bake-ovens, purchasing delivery trucks, moving into better buildings, and in diverse others ways. Marginal producers whose bakeries were not paying were encouraged to continue in business; and many journeymen set up shops of their own. Meanwhile the number of loaves eaten had risen little, if any, and the bakers found that their industry had an excess of capacity. Let us assume this excess to have been ten per cent.

As previously indicated, in my illustration I am considering a single consumers' commodity, namely bread. I shall follow the line of production backward through a single one of the many capital commodities used in the production, selecting for this purpose the bakeoven. While the bakers were expanding, the manufacturers of bakeovens found their sales increased by ten per cent. To meet this new demand they enlarged their own capacity by installing new machinery, increasing their purchases of raw materials, and constructing new buildings. As in the baking trade, marginal

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CHAPTER NEWS

TECHNOLOGY & SOCIAL CHANGES by Prof. Walter Rauterstrauch, Columbia University. Under the auspices of New York Chapter, Engineering Societies Building, 29 W. 39th Street, New York, Thursday, March 9, 1933. All Engineers and general public invited.

NEW YORK COUNTY

The New York County Chapter under the leadership of its president, Professor W. J. Krefeld, is preparing to hold a mammoth meeting in the large auditorium at the Engineering Societies Building, 33 West 39th St., New York City, on Thursday, March 9th, at 8:15 p. m.

The guest speaker of the meeting will be Professor Walter Rautenstrauch, head of the Department of Industrial Engineering at Columbia University, who will lecture on the subject of "Technology and Social Changes". The lecture will be followed by a discussion which will be open to all.

Invitations have been sent to the Kings, Queens, Richmond, Bronx, Westchester, Nassau and Suffolk County Chapters of the New York State Society and to the Bergen, Hudson, Essex, Union, Passaic and South Jersey Chapters of the New Jersey Association of Professional Engineers to co-operate in promoting the success of the undertaking. All engineers and their friends will be welcome.

This authoritative discussion of existing great economic and social problems, based on novel technological researches, is of most timely interest and New York County Chapter is to be congratulated upon its initiative in arranging for its presentation before the professional engineers of the metropolitan area.

* * *

WESTCHESTER COUNTY

The Westchester County Chapter held its regular monthly meeting on January 11th, at the County Court House, White Plains.

The proposed new Building Code for Westchester County—the main topic of consideration—was discussed by guests and members of the Chapter. Colonel A. Pierson Hoover, Chairman of the Yonkers Planning Commission was the principal speaker. He described a trend within the metropolitan area which promises to increase the commercial and industrial development of the County stating that, if full advantage is to be taken of this trend, preparations must now be made to establish legal construction standards conforming with the most modern building practice. And he declared that, as sixty-five percent of a Building Code is engineering, engineers shou'd assume leadership in the movement for its modernization. He is quoted as saying that "It is not sufficient for this society of engineers to sponsor the movement to scrap the old codes and put in operation a new code but your association must put over the idea. . . Your job is to put it through . . ."

Mr. James W. Armstrong, Superintendent of Buildings of the City of Yonkers and Chairman of a representative committee now engaged in the preliminary work of organization, described the method of procedure adopted in creating the necessary executive, advisory and technical committees and of the functions these committees will perform in the preparation of the code. It is anticipated that representatives from every village, town and city of the county will be given place on these committees.

Mr. Harold W. Watt, president of the Chapter, responding to the inspiration of the occasion declared that the engineers and architects of Westchester County in co-operation will accept the challenge of the opportunity and devise a code, modern in its provisions and expression, which will promote in fullest measure the development and welfare of Westchester County.

It was reported that representatives from every department and branch of the building and construction industries and their allied trades were present at the meeting and the enthusiastic interest manifested by all can be regarded as a happy augury for the success of this worthy endeavor.

Engineers have long been reproached for their lack of interest in matters of civic importance. The civic activities of the Engineers of Westchester County are convincing demonstrations that this tradition of civic insensibility and apathy is happily passing and that the Engineer of today is developing a higher sense of civic responsibility which will make him a more valuable member both of his community and his profession.

* * *

ESSEX COUNTY

Essex County Chapter advocates, through its Secretary, H. W. Henry, the enactment of legislation establishing the requirement that real property mortgages be accompanied by survey maps prepared by licensed land surveyors when submitted for filing at the office of the County Clerk. It recommends that standards be set up which by their observance will eliminate or minimize indefinitenesses of boundary descriptions and markings It also suggests that the error of closure be recorded on each map which error shall be less than the minimum stipulated in the law.

* * *

MONROE COUNTY

Mr. Roy H. Hendrickson, Secretary-Treasurer of the Monroe County Chapter has transmitted the following information regarding the annual meeting which was held on January 16th, at Powers Hotel, Rochester.

The Chapter selected Mr. George A. Teeling, Chairman of the Membership Committee, to represent the Chapter at the Winter Meeting of the State Society to be held at Albany on February 4th.

A resolution was adopted protesting against the illegal diversion of gasoline and motor vehicle tax funds to other than highway improvement uses and instructing the Secretary-Treasurer to transmit copies to the Governor, members of the State legislature and other officials.

A committee was appointed to investigate reports that "work relief men" are being employed to perform work of a strictly engineering character for compensation out of all relationship with the importance of the work performed.

Following the business of the meeting Mr. Charles B. Bechhold, a prominent member of the legal profession in Rochester delivered a highly instructive address on the laws of the State governing the practices of various professions. Examples of illegal encroachments upon professional fields were cited and the Chapter was praised for its efforts to prevent the invasions of trespassers into territory legally preserved for the sole use of those whose qualifications have been certified by governmental authority.

The following officers and directors were elected: President, Charles W. Marvin; Vice-President, Howard S. Thomas; Secretary-Theasurer, Roy H Hendrickson; Directors for Two (2) years, Charles W. Blazer, Leo J Brazill, Gloster P. Hevenor.

Cordial felicitations and best wishes are extended to the "Old Dependables" upon whom the honors of leadership have been conferred in recognition of their services to the Chapter and to the Society.

* * *

QUEENS COUNTY

An important letter has been addressed by Mr. J. Franklin Perrine, President of Queens County Chapter, to the Engineers of Queens County commenting upon the increasingly important participation by Egineers in our social and economic development and extending invitations to all to attend the regular monthly meeting of the Chapter at the Medical Centre on January 26th.

The proposed revision of the Charter of the City of New York will be the chief topic of discussion which will be directed toward the consideration of a plan of reorganization of the City government which has been suggested, after considerable thought and study, by Mr. Arthur V. Sheridan, past president of the State Society. This plan has been analyzed by a committee composed of George P. Winn, Frank Lilien, John J. Delaney, William C. Kochendoerffer and William

(Continued on next Page)

EXAMINATION QUESTIONS

Due to the importance and length of the articles appearing in this issue, the publishers were unable to include the continuation of "Examination Questions" For License As Professional Engineers. Considerable space will be given to this valuable and informative series in our March number.

Chapter News

(Contined from Previous Page)

Bertram which will report the result of its studies and its recommendations to the Chapter.

This activity of Queens County Chapter in its study of the City charter with a view toward submitting recommendations affecting the governmental structure of the City of New York is of particular interest when considered together with the following activities of other Chapters: a study, by Richmond County Chapter, of the zoning requirements of Staten Island; the preparation of a new uniform Building Code, by Westchester County Chapter, for all of the political subdivisions of the State within Westchester County; studies of the Revised Building Code for the City of New York by Kings and Bronx County Chapters. The chapter recommendations regarding those matters will constitute notable contributions of thought and study by Engineers toward the solution of problems of government.

* * *

ONONDAGA COUNTY

Through the courtesy of Everett R Enos, Secretary of the Onandaga County Chapter, information has been received of a recent meeting of the Chapter, at the Hopper Glen Tea Room in Syracuse, over which Frank B. Floyd presided.

A progress report was made by Harold J. Dawson, Chairman of the Grade Crossing Elimination Committee, of the investigations and studies being conducted by the committee, and of correspondence with the Technology Club of Syracuse on that subject.

The Ethics and Practice Committee through its Chairman, Thomas L. Curtin reported the progress being made toward the completion of a Code of Ethics. This committee was empowered by the Chapter to invite the cooperation of the Solons of the profession in the County in the preparation of schedules of minimum fees for engineering and surveying services. It was also charged with the investigation and correction of misuses of the term Engineer.

Onandaga County Chapter is making worthy contributions of service toward the advancement of the welfare of the public and the profession within its county confines and deserves the active support of every engineer and surveyor eligible for membership in its ranks.

* * *

KINGS COUNTY

Kings County Chapter held its "First Winter Meeting" on December 15th, 1932, at the Brooklyn Engineers' Club.

The following interesting report of the meeting was submitted by Roy C. Cram, Secretary of the Chapter:

"The December meeting developed a lively discussion of matters relating to the license law and to the proposed N. Y. City Building Code.

Professor Lawson, in charge of Civil Engineering at Rensselaer Polytechnic Institute was a guest of Director McCormick and spoke on the need of a clear definition of the word "evaluation" as found in the section defining the practice of professional engineering. This will have an important bearing on the conduct of appraisals by persons other than engineers.

The use of the word "professional" in conjunction with the word "engineer" evoked comment. Further points pertinent to the license law brought out by the discussion related to: 1—The right of corporations to practice engineering and the possibilities for evasion of the law; 2—the need for lowering the monetary exemption value of engineering projects and possible elimination of money value, thus bringing all projects within the scope of the law; 3—the desirability of eliminating the exemption clauses covering public service corporation employees (this now appears to work to the detriment of employees of these corporations—engineers without license—who sever their corporate connections for any cause); 4—the apparent absurdity of the county clerk's registration requirement for licensees since March 1932 when about 12000 prior licensees are not required to register in the same manner.

The administrative section of the N. Y. C. Building Code now before the Board of Aldermen was the subject of strong comment and the belief was expressed that engineers are subjected to discrimination in several respects. It was suggested that all money values placed to define a limit for the necessity of filing of plans for alterations should be eliminated thus requiring the filing of plans by engineers or architects in all cases. The further study of these points was referred to the Chapter Building Code Committee."

The January meeting was held on the 19th of the month. A most interesting and entertaining program of sound films was presented by representatives of the New York Telephone Co. under the direction of Michael J. Curley, demonstration manager, giving an insight into the marvels of engineering behind the familiar telephone. Vocal selections by Donald Fisher of the Telephone Company were warmly applauded by the members and their wives and friends who were presnt at the meeting.

Mr. Charles W. Burke, President of the Chapter, urged those present to attend the meeting which will be held under the auspices of the New York County Chapter on March 9th. Mr. Burke, referring to the much discussed subject of "Technocracy" stated that "our profession has long been recognized for its sobriety of thought and its exercise of mature judgment" and that "we cannot accept it, even in part, without a thorough investigation and study of the subject."

The Constitution and By-Laws and the Code of Ethics and Practice of the Chapter have been published in a very attractive booklet dated December 1st, 1932. This booklet contains also a roster of the charter members and past-presidents of the Chapter—an Honor Roll of the names of those to whose initiative, courage and professional interest the founding of the Chapter was due.

The early days of the State Society and of its older Chapters are rapidly receding into the past and the adoption of Honor Rolls commemorating the services of the founders and leaders of our Society and its Chapters would not only constitute a graceful acknowledgement of appreciation of their efforts but would also serve to stimulate the creation of new Chapters in those counties of the State which are yet outside the pale of the organized control of the State Society.

* * *

BRONX COUNTY

The regular monthly meeting of Bronx County Chapter, at which Professor Alexander Haring, president of the Chapter presided, was held at the Concourse Plaza Hotel on January 5th.

The following committee was elected to nominate officers and directors for terms of office in accordance with constitutional provisions: J. A. Brunner, Chairman, J. P. Wohlpart, I. J. Stander, T. H. Normile and W. M. Husson.

Major David M. Oltarsch, Consulting Engineer, addressed the meeting on the subject of the City Surveyors of New York City. The address aroused notable interest and evoked considerable discussion.

* * *

RICHMOND COUNTY

The annual meeting of the Richmond County Chapter was held at the Institute of Arts and Sciences, St. George, Staten Island, on January 12th.

The following officers and directors were elected: President, Frederick H. Zurmuhlen; Vice-President, Herman W. Ordeman; Secretary, John Rader; Treasurer, Ernest P. Neuschwander; Directors for three (3) years, Emil A. Verpillot and Victor H. Reichelt.

Announcement was made by the President of the appointment of the following standing committees: Public Relations—H. W. Ordeman, Chairman, J. J. Welsh, William Merrifield;

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Technocracy—What Is It?

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has been identified with and accused of sponsoring the same with the objective of world domination in mind.

The engineer does not seek to further his interests at the expense of Society. Neither does he desire to create a civilization subservient to himself. Of all groups none is less given to selfishness and to self aggrandizement than engineers. In fact, the reluctance of engineers to inject themselves into society's activities merits and has received condemnation. That they are now so much in the minds of men is due to the breakdown of the machinery of a civilization resulting from engineering creations. It is inevitable that they will be called upon to help repair that machinery which so greatly depends upon them for maintenance.

Today Society needs the engineer more than he needs Society. He stands ready to offer his services, not to further selfish ambitions but to save civilization from crumbling under the weight of its own ramifications and the incompetent direction of administrators who have sought to make infallible the man made financial theories of the last century. To identify engineers as a body with pronouncements, whether they be findings or proposa's, of Technocracy or any other social program, is at the present. and will probably always be, unwarranted. The engineer is primarily an individual citizen and is as susceptible to a difference of opinion with his fellow engineer as with any other human being.

Technocracy, condemned or applauded, is not being and has not been set forth as the engineer's solution to the problems confronting the world today. That some of those conducting the research work have been engineers does not signify that the engineering profession is advocating, sponsoring or responsible for the findings or contentions of the Technocrats. As a matter of fact, no organized society or association of engineers, at least in New York, has ever given its stamp of approval to any of the pronouncements of Technocracy. Neither has any society or for that matter any individual given evidence of being in possession of sufficient knowledge to thoroughly analyze and pass deliberate judgment upon the subject.

Approval and condemnation are alike unwarranted until exhaustive study of a definite program justifies a conclusion. Engineers are not in the habit of passing judgments or making predictions until possessed of all the essential data and the results of scientific and thorough analyses.

Political economists, financiers, sociologists, politicians, newspaper writers, radio commentators and various other self-admitted authorities on almost any subject are seeking to place Technocracy upon the doorstep of engineering. Incapable perhaps of understanding the processes of either of the objects of their animosity they resort to ridicule.

The engineer has never considered ridicule as a weapon applicable to the solution of a problem. Attempting to discredit engineers by confusing them with so-called technocrats is perhaps more often the result of desire rather than of misunderstanding upon the part of the exponents of an existing order that, so far as they personally are concerned, must be maintained, even at the expense of every engineer, if the same be necessary.

The engineer disclaims any responsibility for the findings or statements of Technocracy. He, likewise, disavows any connection with the commentators and critics who, all too willing to pillory engineering and attribute to it the ills which have been born of the abuses of individualism under the present social system, seem to know more about Technocracy than the so-called technocrats themselves.

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Canadian Engineers Point Way

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CORPORATION OF PROFESSIONAL ENGINEERS OF QUEBEC

By Order in Council dated May 12, 1932, bearing No. 1136, His Honour the Lieutenant-Governor has been pleased to approve the following tariff respecting the Corporation of Professional Engineers of Quebec.

TARIFF OF FEES

Schedule of Minimum Charges for Services rendered by members of the Corporation of Professional Engineers of Quebec, in private practice.

The following schedule shall apply in absence of any specific written agreement between the engineer and his client.

Ordinary consultations

1. For consultations which do not necessitate a written report, the charge to the client shall be established in accordance with the time spent. The basis shall be a professional day of six hours remunerated at the rate of $50.00.

Written reports, valuations

2. For study of a project with preliminary report, sketches and estimates based on reconnaissance only and not involving detailed surveys, and plans, or for investigation or study of a project prepared by another engineer accompanied by a report on the subject, for study and report on questions in litigation, for work as valuator, the engineer's fee shall be $50.00 per day. The client shall pay besides the above the travelling and out-of-pocket expenses incurred by the engineer in connection with the work and shall also pay the engineer for the services of the assistants whose employment shall be necessary for said work.

Written reports with preliminary plans and estimates of cost preparatory to the preparation of construction plans and specifications

2. a. For the preparation of a written report on a project with surveys, studies and consultations, and including preliminary plans and detailed estimates of cost, the engineer's fee shall be based upon a percentage of the estimated cost of the project as follows: where the estimated cost is fifty thousand dollars ($50,000.00) or less, 2%; over fifty thousand dollars ($50,000.00) and not over one hundred thousand dollars ($100,000.00), 1¾%; over one hundred thousand dollars ($100,000.00) but not over five hundred thousand dollars ($500,000.00), 1½%; over five hundred thousand dollars ($500,000.00), but not over one million dollars ($1,000,000.00), 1¼%; over one million dollars ($1,000,000), 1%.

In addition to the above fees, the client shall pay the travelling and out-of-pocket expenses incurred by the engineer in connection with the work, and shall also pay the engineer for the services of the assistants whose employment shall be necessary for said work.

Preparation of construction plans and specifications and supervision of work and acceptance of complete work

3. For the preparation of construction plans and specifications advising on the award of construction contracts, for the supervision of construction, for the testing and acceptance of machinery or construction works, including the preliminary reports, plans and estimate, the remuneration of the engineer shall be proportionate to the cost of the undertaking. Fees shall be in the first place based upon the estimated cost of the project, and, in case of works proceed to construction, the actual fees shall be in accordance with the total cost of the undertaking. The following percentages shall represent the fees of the professional engineer and shall include remuneration for services of his office staff and overhead expenses.

Preparation of construction plans and specifications

3. a. For the preparation of construction specifications and plans necessary for the receipt of tenders, the fees of the engineer shall be: three per cent (3%) of the cost of the works, provided the estimate is for an undertaking of fifty thousand dollars ($50,000.00) or less; for enterprises to cost over fifty thousand dollars ($50,000.00) and less than one million dollars ($1,000,000.00), the fees shall be two and one half per cent (2½%) of the cost, and for all expenditure over one million dollars ($1,000.000), the fee shall be two and one half per cent (2½%) on the first million dollars, and two per cent (2%) for all expenditure in excess of this first million dollars.

Supervision of construction, testing and acceptance of construction work and machinery

4. a. Partial Supervision.

Partial supervision, comprising consultations at the engineer's office and occasional visits to the works during the normal duration of construction, shall be remunerated at the rate of three to two per cent (3% to 2%) of the cost of the undertaking, depending on the importance of the works. The remuneration of the engineer shall be three per cent (3%) of the cost of the works, provided the estimate is for an enterprise of fifty thousand dollars ($50,000.00) or less. For undertakings to cost over fifty thousand dollars ($50,000.00) and less than five hundred thousand dollars ($500.000.00), the fees of the engineer shall be two and one half per cent (2½%) of the cost, and for all expenditure of over five hundred thousand dollars ($500,000.00) the fee shall be two per cent (2%) of the cost.

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A Study of the Registration Laws of Other Professions

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nurse or trained attendant, without complying with the provisions of this article."

The foregoing is an example of a statute establishing "titular registration" as distinguished from "licensing to practice." The recently proposed registration law for Architects in Connecticut, modeled after Architects' laws in other states, is another illustration of titular registration. These professions have reached the conclusion that it is more important to protect the lawful use of the title than to endeavor otherwise to control practice.

Pharmacy: The police power of the State to restrict the professional or commercial use of any words desired is illustrated in the following excerpt from the Pharmacy statute:

"*Unauthorized use of terms.* No person or corporation shall hereafter carry on, conduct or transact business under a name which contains as a part thereof the words 'drugs,' 'medicines,' 'drug store' or 'pharmacy,' or similar terms or combinations of terms, or in any manner by advertisement, circular, poster, sign or otherwise * * * * unless * * * * duly registered and authorized by the state board of pharmacy."

(2.) Provisions for Enforcement

The Medical law provides for a full-time *paid Secretary and a corps of inspectors* to investigate violations for prosecution:

"The regents shall appoint a *secretary* to the board of examiners, who shall not be a member of the board * * * * and who shall receive an annual compensation of not less than four thousand dollars, payable from the fees received under this article. The secretary shall be a duly licensed physician."

"The regents may appoint not less than *five* or more than *seven inspectors*, to be paid as provided in * * * * this article, *under the direction of the secretary of the board* of medical examiners, to investigate promptly and thoroughly such violations and to procure where possible legal evidence of the same for prosecution of the offenders."

"All violations of this article, when *reported to the department* and duly substantiated *by affidavits* or other satisfactory evidence, shall be investigated and if the report is found to be true and the complaint substantiated, the department shall report such violation to the attorney-general and request prompt prosecution of the violation."

"Upon the application of the *committee on grievances* (of the State Medical Society, etc.) to the secretary of the board of medical examiners *the services of an inspector or inspectors* may be furnished for making necessary investigations for said committee."

The Dentists' statute also provides for a paid Secretary:

"The *secretary* (of the Board) shall be a licensed dentist who has been in practice in this state for at least five years with a degree of doctor of dental surgery. He * * * * shall receive a salary of four thousand five hundred dollars, payable from moneys received under this article."

(3.) Authority of the State Board

Those who believe that the authority and official interest of the State Board for any Profession must be limited to examination of applicants and revocation proceedings should note the following statement of responsibilities in the statute regulating the practice of Pharmacy in the State Education Law:

"The board shall have power:

(a) To regulate the practice of pharmacology.

(b) To regulate the sale of drugs, chemicals, medicines and poisons.

(c) To regulate the employment of apprentices and employees in pharmacies.

(d) To regulate the working hours and sleeping apartments of employees in pharmacies.

(e) To regulate and control the character and standard of drugs and medicines compounded and dispensed in the state, to employ inspectors and chemists to secure samples and to prevent the sale of such drugs * * * * as do not conform to the formulae, standards and tests of the pharmacopoeia and formulary.

(f) To regulate the retailing of poisons and to adopt schedules.

(g) To issue temporary permits limited to definite areas.

(h) To *investigate alleged violations* of the provisions of this article, to conduct hearings in respect thereto, ... and to bring the same to the notice of the attorney-general."

(4.) Expenses of Administration and Enforcement

The Medical law makes a highly effective and adequate provision for the expenses of administration and enforcement:

"*Nothwithstanding the provisions of any other general, local or special law*, all fees, fines, penalties and other monies derived from the operation of this article shall be paid to the department and *shall be available, together with the appropriations made from time to time by the legislature*, for the payment of all proper expenses of the board including the salaries of the *secretary* of the board of medical examiners and his *assistants, inspectors, examiners*, any *deputy attorney-general* assigned for the purpose of enforcing the provisions of this article, and *other employees*, and their necessary disbursements, including the disbursement on bills duly rendered and audited for the administration of the *committee on grievances*."

A substantially identical phrasing is used for the corresponding provision in the Pharmacy statute.

(5.) Recognition of State Professional Societies

At least two of the professional registration laws in New York State (Dentistry and Chiropody) have incorporated *in the same statutes* the charters of the respective State professional societies defining their power and responsibilities, thereby establishing statutory recognition of such societies. The Dentistry statute also establishes district dental societies, defining their powers; the following are illuminating excerpts:

"The dental society of the state of New York is continued and *shall be composed of the members of the district societies.* The State dental society shall annually meet * * * *. The society shall elect annually * * * *. The society shall have the power * * * *."

"*Every licensed and registered dentist* in the judicial district in which such society is formed, *shall be eligible to membership* in the district society of the district where he resides or practices dentistry."

"No by-law of any district society shall be repugnant to or inconsistent with the by-laws of the *state society*."

Yes, the foregoing clauses are *in the State law* regulating the practice of Dentistry!

A majority of the professional laws name the respective State societies and vest them with the authority *to nominate the members of the Boards of Examiners.* The following are examples:

"The N. Y. State Veterinary Medical Society shall at each annual meeting *nominate five examiners.* * * * *. The regents shall appoint from such list the examiners required to fill any vacancies that will occur from expiration of term on July thirty-first."

"The New York State Nurses Association at each annual meeting shall *nominate for examiners* two of their members, each of whom shall be a registered nurse and have had not less than five years' experience in their profession."

"The state board of pharmacy shall consist of nine examiners, four of whom shall be residents of the city of New York. At each annual meeting of the association (*the New York State Pharmaceutical Association*), nine licensed pharmacists shall be nominated by ballot * * * *. From the number thus submitted or from the other licensed pharmicists of the state the regents may appoint three persons to succeed the members (of the board) whose terms of office expire on the following July thirty-first."

In setting up the Grievance Committee to try charges against licensed physicians, the Medical law provides "that said committee shall consist of four members who have been duly nominated by *the Medical Society of the State of New York*, two members by the *New York State Homeopathic Society*, one member by the *New York Osteopathic Society*, and the regents upon their own nomination shall appoint three members of conspicuous professional standing."

Recognition of a State Society *in certifying candidates for licensure* is exemplified in the following provision:

"No person shall be entitled to register as a chiropodist unless he or she shall hold the license provided for in this article, or *a certificate issued by the Pedic Society of the State of New York* and indorsed by the department as provided in the preceding section."

Recognition of the state and county professional societies *as enforcement agencies* cooperating with the State Board of Examiners is exemplifed in the Medical law, which provides that the annual printed list of duly registered physicians shall contain at the beginning thereof the words:

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Canadian Engineers Point Way

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4. b. Complete Supervision.

Complete supervision, comprising consultations at the engineer's office, visits to the works, and in addition the necessary representatives of the engineer on the works, the testing of materials and machinery, and the acceptance of machinery and works, shall be remunerated at the rate of seven to three and one half per cent (7% to 3½%) of the cost of the works, depending upon the importance of same. A remuneration of three and one half per cent (3½%) shall apply to undertakings of more than one million dollars ($1,000,000.00), four per cent (4%) for works costing between five hundred thousand dollars ($500,000.00) and one million dollars ($1,000,000.00), five per cent (5%) for works costing between two hundred thousand dolars ($200,000.00) and five hundred thousand dollars ($500,000.00), six per cent (6%) for works costing between fifty thousand dollars ($50,000.00) and two hundred thousand dollars ($200,000.00), and seven per cent (7%) for works costing fifty thousand dollars ($50,000.00) or less.

General conditions

5. A day's work of a professional engineer shall be computed as six hours. Nevertheless, when the engineer is obliged to go out of the city where his office is situated, his fees, when working on the per diem basis, shall be computed for each calendar day at the rate fixed, and each 24 hours or fraction thereof shall be considered as a whole day without taking into consideration the time actually spent on the work each day.

6. The fees of a professional engineer in case of questions in litigation are not contingent on the decision of the Courts of Justice, and shall be settled by the client immediately after the enquete.

7. All test borings, assays or analyses necessary for the complete examination of the site and foundations for the erection of a structure, shall be paid by the client in addition to any other fees or percentages above stipulated.

8. If the client desires changes in accepted specifications or plans, the engineer shall be entitled to a supplementary remuneration based upon the necessary expenses and time required to alter such plans and specifications, either by himself or by his office staff. The said remuneration shall be based upon the per diem rates hereinbefore mentioned in paragraph 2.

9. In the preparation of specifications and plans, or during the supervision of construction, particular problems may arise which may necessitate calling a specialist into consultation. In such case the fees of the specialist, whose engagement must be authorized by the client, shall be paid dirctly by the client in addition to the fee of the engineer.

10. The actual cost of the travelling expenses and other disbursements incurred by the engineer in connection with the supervision of the works, except the salaries, travelling expenses, and living expenses of his staff to and from and on the works, shall be paid monthly by the client in addition to the percentages mentioned above in paragraph 4.

11. The percentages named for remuneration in paragraph 4 for supervision during construction are intended to cover the services of the engineer and his staff during the period ordinarily expected to be covered by such construction, and in the event of delays occurring through no fault of the engineer, the engineer's remuneration shall be increased to compensate him for the extra time necessarily spent by him and his staff in supervision.

12. In case of bankruptcy or failure of the contractors during the period of construction, involving additional work on the part of the engineer over and above that contemplated in his original agreement for supervision and acceptance, or in case any other work may be necessary and not directly relating to the preparation of specifications and plans or to the ordinary supervision of the works, the client shall reimburse the engineer and his staff on the per diem basis hereinabove mentioned in paragraph 2 for all such services.

13. All specifications and construction data and documents are the property of the engineer. The client is entitled to a copy of plans and specifications for record purposes only, and he shall not use any of these for the construction of another project without remunerating the engineer for the use of said plans and specifications.

True Copy, certified by

A. MAILHIOT,
Registrar.

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What the New York State Society Is Doing

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outside of Yonkers, Mount Vernon and New Rochelle. The remainder of the county has always considered that its proper development lay along the lines of the residential growth.

Now Colonel Hoover presents this new idea. He believes that the decentralization of business establishments in Manhattan must inevitably reach into Westchester and that we will in time find headquarters for large corporations seeking space here.

There is no reason why that cannot happen. Many large corporations in metropolitan areas have deliberately avoided the traffic congestions of large cities by establishing themselves in the suburbs. They find it easier upon their employes and they find the taxes lower.

On that basis, Colonel Hoover urged the engineers of the county to be prepared with a modern building code which would permit the erection of adequate structures for these corporations at a minimum cost. There is no doubt in the scientific mind today that the Westchester building codes are wholly lacking in uniformity and, to a large extent, are archaic.

Our building codes of villages, towns and cities have not kept pace with the new methods of building. And above all, they should be uniform.

ENGINEERS FORM AND CHOOSE CODWISE HEAD

(From the Kingston Freeman)

On Monday evening, January 9, The Ulster County Chapter of the New York State Society of Professional Engineers was organized with the assistance of Frank X. Bode of the Albany Chapter; Mr. Watts of Essex county, and Mr. Zimmerman of the Utica chapter.

G. Wallace Codwise was elected president; Henry Darrow, vice-president; Edward P. Ward, secretary-treasurer, and the following were elected directors: P. Edwin Clarke of Elenville and James G. Guttrige for two years, and James F. Loughran and Sidney K. Clapp for one year.

The aim of this society is to promote the standards of professional engineering and to bring to the attention of the public and its officials the greater benefits which will result from the more efficient methods available through the employment of Professional Engineers upon all public projects.

It is hoped that all licensed professional engineers and land surveyors residing in Ulster county will affiliate with the Ulster County Chapter as there are many obvious reasons why concerted action upon their part will result in mutual advantages to both engineers and the people of the county.

Dr. D. B. Steinman, one of the foremost authorities on bridge design, is the president of the State Society.

The first meeting was largely attended and many additional members are expected at the next meeting.

PROTECTING THE NAME "ENGINEER"

(Editorial from the Ithaca N. Y. Journal-News)

Protection of the title "Engineer" is being actively forwarded by the New York State Society of Professional Engineers.

No other learned profession, says D. B. Steinman, president of the society, tolerates the unauthorized appropriation of its professional designation.

When one comes to think of it, there assuredly is a big crop of "engineers" in this, that or the other line. It is not surprising to hear that many of those assuming the designation lack professional education and training.

Engineers having such professional training consider that in seeking legislation and licensing laws which will give an opportunity to prevent unauthorized use of the title they are protecting not only themselves but the pubic.

VOLUNTEERS FOR A HARD JOB

(Editorial from Staten Island Advance)

A project that may result in tremendous benefits to Staten Island, or else be forgotten as just another report in an other dusty pigeon-hole, was quietly launched Thursday night by the Richmond County Chapter of the New York State Society of Professional Engineers and Land Surveyors.

The chapter appointed a committee to study Staten Island's zoning system and recommend reforms. The

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Engineer Versus Scientist

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and installed, which entirely eliminate the human factor, so that it is possible for you, by dialing a number, to connect with any phone in a system of 10,000,000 telephone instruments, all in a very few seconds and without the aid of an operator.

It is still within the memory of most of us that a telephone conversation between persons a short distance apart was an unbelievable phenomenon. Today, we not only can speak over thousands of miles, but the voice is amplified mechanically at periodic intervals.

A recent accomplishment of engineers is a device that talks to the telephone operators and is used in a system that is being converted from manual to automatic operation. As a number is dialed, this remarkable device repeats verbally the number to the operator, who makes the proper connections.

Devices have also been developed by telephone engineers which can be attached to telephone instruments enabling the deaf to converse over the telephone. These developments have been a God-send to many thousands of afflicted persons.

It is necessary to credit these humane devices to engineers.

Now—a few words on Radio:

Radio has grown, in a few short years, from a swaddling infant, to a giant, and has taken its place among the leaders of world industry. Starting with the early type of spark transmitter, radio transmission has seen rapid advancee, until today we have the huge vacuum tube broadcasting stations of superpower, operating on cleared channels. Stations of 50,000 watts power are becoming common and today, 200,000 watts are being used experimentally. The early spark transmitters were limited in range and power and resulted in extremely erratic and unsatisfactory reception.

The development of the vacuum tube for transmission purposes, brought about the use of continuous waves for radio telegraphic communication, and made radio telephony, in its present form, possible. Radio broadcasting stations have steadily grown in power, until the present super-power station spans the earth.

Advancement in radio receiving sets has kept steady pace with broadcasting. The crystal receiver with a range of less than 50 miles, is just a memory. Developments in vacuum and gas-filled radio tubes have made possible receiving sets so sensitive as to be able to detect and amplify almost inconceivably weak signals. Selectivity in radio receivers has been increased until the old "silent night" is no longer necessary or desirable. In fact, sets are now being made that can selectively tune two stations operating on the same frequency, if the stations are in different localities. It is also possible, in the modern reciver, to eliminate or emphasize similar instruments in an orchestra.

At the beginning of the last decade, radio was a mystery and something of a luxury to most Americans. Today, it is accepted as a necessity in half the homes of the United States and the possibilities of national education with radio as a medium are being studied.

Radio has provided a new carrier for local, national and international advertising.

The astounding developments in radio have been possible only thru the untiring efforts and resourcefulness of the radio and electrical engineers throughout the world.

The application of radio to the remote control of various devices, produces an awe inspiring vista. It is possible to maneuver an automobile or aeroplane entirely by radio, from a distant point. In this manner, aeroplanes carrying huge bombs of poison gas and explosives may be sent to a destination hundreds of miles away, discharge the bombs on the target, and caused to return. In a like manner, battle ships may be completely controlled—that is, sent to a given point, broadsides fired, torpedoes released, and then returned to their base. By means of radio control as well, aerial or marine torpedoes may be controlled so they will not miss their target. Large guns may be aimed and fired in the same way.

If we permit ourselves to imagine a war employing weapons of this nature, we are terrified by the ruthless inhumanity of it. It is to be expected that the achievements of engineers have their destructive, as well as their constructive, applications.

Radio engineers have recently developed beam transmission so that absolute secrecy of communication between two points may be obtained. Incidentally, beam transmission affects an enormous power saving over ordinary radio broadcasting.

The development of photo-electric cell vacuum tubes has brought about the inception of television. Although it is still in the laboratory stage, engineers are making steady advancements and will soon be able to present it to the world.

A number of short wave bands have been set aside by the Federal Radio Commission for use in broadcasting television. A few of these bands have already been assigned to, and are being used by various broadcasting agencies.

Development in the vacuum and gas-filled electron tube field seems particularly wonderful. This may be because the many ways in which they can be used, or because of the vistas they have opened up to our view. Since the time of Edison effect, we have witnessed steady advancement in these remarkable devices—both as to new design, and refinement of old design.

The introduction of the three element tube by DeForrest, started radio on its swift journey. Then came the four elment or screen grid tube, carrying an amplification factor so large as to make a four-tube receiver, using only two screen grid tubes, superior to one using eight or nine of the old three element tubes. Just previous to this time, power tubes for audio amplification were developed, permitting the use of the dynamic speakers. Then came the pentode or five element tube and another stride forward was taken, although its possibilities have not yet been fully realized.

The thyratron is truly a tube to conjure with. It has found use, in its smallest form, as an efficient rectifier for radio purposes. In its larger form, it is useful clear thru the fields of conversion and transmission of electric power, of which we have spoken before. Because of compactness, inexpensiveness and ease of operation, it is being used to replace such old standbys as the rotary converter, the transformer and oil-switch.

Just as the thyratron can be used to handle tremendous currents, so can the ultra sensitive grid glow tube be used in circuits where only the most delicate measuring instruments can be used to detect current flow. Electricity in the nature of one millionth of an ampere, is sufficient to cause the tube to function and operate relays requiring several amperes.

The development, by engineers, of the photo-electric cell, which changes the characteristics of an electric circuit, in proportion to the amount of light falling on it, has made possible telephotography, and has enabled us to transmit pictures between distant points commercially. The photo electric cell, too, is the basic element in our present methods of television or radio vision, in which moving scenes are now broadcast. This device is used also in sound reproduction and is responsible for present methods of recording sound by light variation on film. This method of recording eliminates all mechanical noises and renders perfect reproduction. In fact, one of our largest broadcasting stations has made light records of certain speeches and then broadcasts the speeches from the records, proving that no difference could be detected between this type of reproduction and actual studio broadcasting.

Automatic machines have been developed for sorting colored articles with enormous speed in which the photo electric cell or electric eye, as it may be called, is the intelligence directing their operation. Not only does this machine increase the speed of sorting, but it is not subject to fatigue and its accuracy is many times greater than the human eye.

Photo-electric cells are now being employed as smoke detectors and thru automatic regulation of mechanical stokers, greatly increase the efficiency of heating and power plants. Methods of fire detection, as well as burglar alrms, have been revolutionized by these remarkable tubes. New types of commercial testing devices employ the electric eye to show up defects and imperfections which hitherto went undetected because of inadequate means of testing.

The application of electronic tubes to the motion picture industry had a revolutionary effect on that form of amusement and education. The advent of talking or sound pictures shook a well-established industry clear down to its foundation and necessitated its complete reorganization. It is not so long ago that you went with curiosity and a certain amount of misgiving to hear your first sound picture. It was positively uncanny to hear words issued from mouths that had always been dumb. Now, visualize your most recent trip to a motion picture theatre—what a difference. The motion picture has been transformed under our very eyes and ears.

(Continued on Page 22)

Cooperation Between Architects and Engineers

(Continued from Page 9)

In addition to the Long Span Bridges that have been described by others.

I am not a critic of Art or of Long Span Bridge Architecture because all such super-bridges create in me a feeling of such appreciation of the purposes that they serve as a tool of transportation that its artistic effect is for the present secondary.

However, when I try to evaluate its artistic effect on me, I think that all the Long Span Bridges have a distinct beauty of their own, which is very inspiring without details.

Its great length and the new horizontal accent it introduces in any setting is entirely new—a thing apart and extended beyond any similar feature in architectural usage and as I see it worthy of our admiration and any additional beauty that we can devise for closer inspection.

There are many other accomplished facts, which make the Metropolitan District a monument to all branches of the Engineering Profession.

The incidental development of the Skyscrapers of New York has necessarily combined the specialties of Civil Engineering and Architecture and we may be proud of the results in many directions.

There comes to mind four notably characteristic examples of the progressive tendencies of Modern Architecture, coordinating with proper Engineering use of modern materials:

1st. Pennsylvania Railroad Station, building covering 8 acres—a big massive architecture above ground, but sitting on an invisible deep yard 800' long, 460' wide and 50' deep, filled with 21 tracks and station platforms. This was made possible by using steel columns, taking up little space for their geat strength. The Architect gave the form of the building, the Engineer made it possible, etc.

2nd. The Grand Central Station, likewise an imposing Architecture of big concourse, halls and vestibules, leading to invisible tracks and platforms in marvelous order, made possible by the Engineer, fitting the utility features to aesthetic demand, etc. Again the Architect was the leader in giving the form.

3rd. The Woolworth building, the highest skyscraper without offets, exposed with large surfaces to wind pressure. The first high building, in which the strains from large wind pressure were scientifically analyzed, and the steel frame work scientifically dimensioned, without which the Architect could not have dared to take the responsibility in his disposition of space and articulated surfaces.

4th. The Empire State Building, the highest in the world, possible only in cooperation with the Engineer, scientifically determining the strains for the loads and from the wind pressure. Erected in one year, 1250 ft. high, which is more than twice the height of the famous cathedral in Cologne, which took 650 years for its construction—Notice the contrasts.

All four structures are examples of the tremendous technical and building resources of our time, which have never been made possible before. It indicates the monumental wonders, which the combination and joint leadership of Civil Engineering and Architecture can create in big bridges, dams, stadiums, and monumental public buildings when needed—all of which is made possible by Engineering with the Architect to give artistic expression to the utility, to the power, to the strength, and to the beauty of our joint efforts.

With the mental equipment and actual tools which such accomplishments and Long Span Bridges evidence, we can feel expectant that there are greater things materially and intellectually just ahead.

I like to think of the individual giving a part of his personal time to all public questions of the day, but professionally avoiding partisanship and giving the best of his technical knowledge and service to all, without regard to politics, religion, or profession.

In line with this thought, the Engineer of noted projects, or the Architect who translates their joint message to the unknown audiences of the generation to come, cannot escape their responsibility to advance the intellectual capacity of all.

Let us try and produce a conception of such subjects that will by architectural treatment of its evident usefulness for the purpose served, create a general appreciation of the aesthetic.

Let us emphasize the artistic possibilities, as well as the material aspect of Engineering and Architecture in our daily works.

Our ideals of Government should be housed in the most lasting and artistic architecture of our day, and it seems to me that the City of Washington, as the home of our Government, is essentially the joint problem and unparalleled opportunity for high service of the architectural profession.

We have made substantial beginnings, but there may be room for improvement as we proceed. I know all Engineers and the public at large hope your profession will make it your collective duty to see that the City of Washington shall be an architectural monument of utility and pure beauty, that will be an outstanding inspiration to the coming ages.

These three men—Gustav Lindenthal, Ralf Modjeski, and Othmar Ammann, have spent their lives climbing a long road full of grave responsibilities and by careful thought and research have shown us how to coordinate our present knowledge of strains and stresses, for our loads and wind pressure, with our present knowledge of the strength, lightness, and adaptability of materials.

These men, Lindenthal, Modjeski, and Ammann, have had the opportunities and have been found with the ability to make history. Let us wish them health and still greater accomplishments.

I thank you on behalf of the profession of Engineering for the action of the Architectural League in giving this testimonial dinner to these three notable Civil Engineers, because of their service to the world at large, in their chosen branch of our great profession.

The Engineer As Umpire

(Continued from Page 10)

County, from Lindsay on the Chesapeake & Ohio Railroad to the James River about 20 miles distant, the C. Company had a contract to build a railroad. One Steele subcontracted for 4 miles of the line according to the plans and specifications. The contract gave the prices for materials to be excavated as well as definitions of the various classes. The contract also provided that, upon all questions arising under the contract, the dicision of the chief engineer of the general contractor should be final as between the parties. A Mr. Fine was the chief engineer of the C. Company as well as its vice-president.

Steele realized that despite efficient work and rigid economy, he would lose $3500 if Fine's estimate was adherred to and sued for $7500. Contending that the chief engineer erred in his classification of loose and solid rock, he employed an expert engineer, James Dickey, to make an independent classification for him. The yardage of the two estimates checked but there was a wide difference in the classification of the material. That classified as solid rock by Steele and Dickey and not allowed by Fine was clearly and unmistakably proven to be the same material, of the same nature and character of rock as that allowed and classed by Fine as solid rock. The court found that the arbitrary rejection by Fine of over 9,000 cubic yards of solid rock and the classification of the same with other material far less expensive to remove was an error of judgment or mistake so gross as to amount to a fraud.

In this case it was not necessary for Steele to impute or prove a moral wrong on the part of the engineer. It was only necessary that the evidence should be sufficient to justify a jury in finding that the estimate of the engineer was so grossly erroneous as to amount to a fraud upon the rights of the injured party. Mistakes in the judgment of the engineer will happen and contractors must abide by them when the mistakes reach the point where they may be termed gross errors the contractor has redress.

In contracts where the possession of a final certificate from the engineer is a condition precedent to final payment, it sometimes happens that, in the exercise of his judgment, the engineer refuses to issue the certificate On the face of the case it would seem that the contractor had no alternative, but it has been held that if, in the exercise of his discretion, the engineer unreasonably withholds his certificate, the contractor may recover without it for the work done. A request for the certificate must be made, however, or a suit brought for a balance due is premature. Estimates made by engineers who are strangers to the transaction are not admissible.

The main objection raised thus far to the judgment of engineers has been that they are too much inclined to favor their employers. This objection is not always present, as illustrated by an incident which occurred while the writer was employed as leveler on rock excavation work soon after graduation. The engineer in charge was friendly to the contractor and was de-

sirous that the amount of rock excavation should not be too small. To make sure of this he ran the rod while the writer ran the level, and in taking rod readings on the surface of the rock before blastnig he held the bottom of the rod five tenths to a foot above the surface instead of upon it, as the writer, who was running a new 20 inch Gurley level with excellent lenses, could plainly see. In this case the judgment of the engineer, as expressed in his estimates, was a fraud on the owner. The writer has reason to believe that incidents of this sort are not of unusual occurrence on public work.

In the city of Detroit several years ago an architect issued a final certificate upon an unfinished building which was being constructed under his supervision. The walls were not properly cemented, the roof leaked, the plumbing was defective and many things yet remained to be done, but he issued his certificate upon the promise from the contractor that all would be made right. The contractor tried to get the final payment from the owner on the strength of the certificate. He got this advice from the court instead:

"Where the final certificate of an architect issued pursuant to a building contract stipulating for certification of the architect was issued before the completion of the work with knowledge that certain specifications had not been complied with, and on the condition that the contractor should do certan things, not including compliance with such specifications, the certificate was issued in fraud of the owner and was not binding on him."

The foregoing incidents lead the reader to several conclusions. First, the custom which places the engineer in the equivocal position of servant and umpire is unfortunate and should be discontinued or modified. Second, engineers' estimates are generally upheld despite outrageous injustics. Third, such estimates may be avoided if fraud or gross error can be shown. Fourth, a judicial temperament is often an asset as desirable in the engineer as in his brother of the legal profession.

* * *

Make This the Last Depression

(Continued from Page 11)

producers were saved from elimination and newcomers induced to enter the field.

But the bake-oven manufacturers did not stop at a ten per cent increase to meet the ten per cent extra demand from the bakers. They could not gauge this demand nor say when it would cease to mount. Even after they discovered that its strength was temporary, they could not entirely stop their progress of expansion, because they had contracted for additional equipment and had new buildings under construction which had to be carried to completion. They stood farther from the consumers than the bakers did, and so were less sensitive to the demand for bread. In other words a time lag came into play.

I assumed that the bakers raised their capacity to one hundred and ten per cent of requirements. Let me likewise assume that the bake-oven trade increased its own capacity to one hundred and ten per cent of the demand of the bakers, making the potential production of bake-ovens one hundred and twenty-one per cent of the true demand, based upon the amount of bread eaten. As a matter of fact, the bake-oven manufacturers were left in an even worse state than would appear from their twenty-one per cent of excess capacity over the normal demand for their articles; because, during the next few years, the demand would fall below the normal. This is because the bakers were already over-supplied with bake-ovens. Only after the excess had been worn out would the full demand be restored.

I shall continue my illustration by going a step farther back along the line of production of bread. To do so I shall select a single one of the kinds of capital commodities which enter into the manufacture of bake-ovens, choosing this time the lathes used in the machine shops at the factories. The manufacturers of lathes, finding their sales to the bake-oven people increased by twenty-one per cent, were stimulated to increase their own capacities. Their dealings with the bake-oven trade formed only a small part of their total business, but the processes which brought about the over-expansion in that direction had done the same in practically all other lines of industry.

I shall assume that when the machine-tool trade found its sales to the bakeoven people increased to one hundred and twenty-one per cent of normal, it found its sales to its other customers increased proportionally. I shall also assume that it not only met this extra demand but also raised its capacity by another ten per cent. It was too far removed from the consumer to be able to gauge ultimate demand and so was stongly affected by the time lag.

The potential production of lathes was now brought to the third power of one hundred and ten per cent, or one hundred and thirty-three per cent, as compared with the normal demands for bread and the various other consumers' commodities, into the production of which these tools enter. Furthermore the sale of lathes would probably be below even the normal requirement for a few years while the existing excess was wearing out.

To carry my illustration farther back, I shall assume that the thirty-three per cent extra metal that the steel mills sold to the machine-tool manufacturers was a factor in their increasing their own capacity to the fourth power of one hundred and ten per cent, or one hundred and forty-six pe cent. Similarly that it led to the iron mines raising theirs to the fifth power, or one hundred and sixty-one per cent.

In my illustration I traced the production of a loaf of bread through the medium of the bake-oven. I might have done this equally well through a barrel of flour, following back to the mills and wheat fields. I could have taken an illustration from some other industry such as meat packing or textiles. In reality the lines of production do not run uninterruptedly from consumers' commodities back to raw materials, but tie into one another to form an intricate network. For example, the machine-tool people sell their lathes not only to the bake-oven industry but also to the manufacturers of farm machinery, whom I would have discussed, if I had traced the loaf of bread back through a barrel of flour.

Furthermore, the lines of production double on themselves, for the machine-tool people sell to the bake-oven trade which stands between them and the consumers and also to the steel mills and iron mines which are back in the direction of raw materials. However, throughout this network of production the principle holds true that the farther back from the consumer an industry happens to be, the greater will be the overcapacity—also the greater will be its need for some method of estimating demand and of restraining undue expansion.

Here are a few random illustrations of pronounced overexpasinon in those industries which produce raw materials, or which give them an early processing. Steel mills at this writing (July, 1932) are operating at about twelve per cent of capacity. Forty per cent of the potential output of the copper mines of the world would suffice for the world's needs. Oil wells in Oklahoma and Texas have been shut in by law; and in California their output has been cut to one-half by voluntary proration. It is seriously proposed to leave a third of our cotton acreage unplanted.

I have described how corporations have been misled into expanding their capacities through discovering an increase in their sales. At the height of a boom they expand in another exceedingly important manner; and that is by invading the field of allied industries. One of them may find itself with a large surplus, even after it has increased its facilities to meet an expected increased demand for its products. It is unwilling to attempt further expansion in its own field, knowing the difficulties too well, but our neighbors' fields always look greener.

For example Henry Ford, on discovering that he was using a third of the plate glass sold in the United States, began to manufacture it for himself. There was no question about a market for his product, since he was his own customer, but the glass which he had previously been buying now remained unsold, or rather it was not manufactured, leaving the old plants running below capacity. It makes little difference that some of this glass had been imported. It had been paid for by the export of American products which now could not be sold. The over-production of a commodity like glass, or rather the over-capacity to produce it, is the concern of the whole world.

As another example of the invasion of alien fields, we have the retail chains which have been established by the mail-order houses. We also see farmers' cooperatives taking up marketing in competition with the commission houses, oil companies installing service stations, and motion picture producing companies setting up circuits of theatres. In the downtown districts of our cities we find enormous office buildings which have been erected by banks, public utilities, insurance companies, and other corporations, not one of which has any primary connection with the handling of real estate. These corporations oc-

cupy a few floors of their buildings and rent out the remainder in competition with the other office space of the city.

So much for the overgrowth while business was increasing. The coming of the period of adversity is so well known that I need only touch on it. During the boom times we added to our consumption of consumers' commodities; but early in 1929 it became evident that we could not, or would not, use the enormous quantities of these which were being offered for sale.

Then came partial shut-downs of plants which produced certain lines of these commodities, and that brought a reduction in employment and also in profits. The result was a further slowing down of consumption, and this in turn caused shut-downs in other lines of consumers' commodities. The slackening in industry began to penetrate backward along the lines of production to capital commodities and raw materials. The process was slow because of the time lag, but none the less sure and relentless. Unemployment spread, feeding on itself; and those who still had work feared to lose it, and cut their expenditures to the bone. Before we knew it we had slipped into a general depression.

In the fall of 1929 the growth of the depression received a sudden impetus from the stock-market crash. The prices of shares had been based on expected earnings of greatly expanded facilities of production. The market fell and continued to fall as it became evident that such earnings would either not be forthcoming or would be very small and perhaps long deferred. The certificates of stock, entirely apart from their quoted values in dollars, represented savings which has been put into factories, railroads, mines, or merchandising establishments with the expectation of future profits. These plants were not on paper. They had an actual physical existence, and were capable of turning out products and rendering services. The difficulty was that such products and services were largely superfluous. They were beyond our requirements as consumers.

Alas for the profits to which we had looked forward! Alas for the high wages! Alas for the steady employment! As a nation we had overreached ourselves in thriftiness. Like Mother Hubbard we went to the cupboard. We had left its shelves groaning with goodies. We found them collapsed under their own weight, leaving us a mass of broken viands and shattered dishes.

At last I am ready to explain how I would prevent the recurrence of depressions. I have laid sufficient groundwork for my explanation to be understood. Here is my plan.

Mr. Lissner will outline his plan in the next issue, which will contain an important announcement as well.

* * *

Society Winter Meeting

(Continued from Page 4)

WHEREAS, in many instances the said proponents are not legal practitioners of engineering and in practically all cases the opponents, without justification, are seeking to discredit engineering as a social factor in civilization through condemnation of Technocracy, and

WHEREAS, the engineering profession of this State has neither sponsored nor approved any of the findings or predictions emanating from either the so-called Bureau of Technocracy or from the multifarious critics thereof who are attributing to the subject of their disapproval much that savors of personal opinion and prejudice rather than of knowledge, and

WHEREAS, opinions based upon incomplete or improper data are not in keeping with engineering methods of procedure, and

WHEREAS, the information available is not sufficient to warrant expression of opinion by engineers, therefore be it

RESOLVED, that the New York State Society of Professional Engineers, in meeting assembled at Albany, New York, February 4th, 1933, does, in behalf of the legally recognized practitioners of this State, disclaim any responsibility for the findings or statements of Technocracy, and be it also

RESOLVED, that it disavows any connection with the commentators and critics who, all too willing to pillory engineering and attribute to it the ills which have been born of the abuses of individualism under the present social system, seem to know more about Technocracy than the so-called Technocrats themselves, and be it further

RESOLVED, that the profession of engineering in this State records itself as sponsoring no particular program or system of political economy and as opposed to any social order or oligarchy that would exclude, or refuse, or fail, to recognize inherent human rights and the usefulness of all elements and worthy pursuits of mankind. (Apopted).

RESOLUTION

Competition from Engineers in Public, Corporate and Business Services

WHEREAS, unregulated competition upon the part of professional men is unjustified and unethical and in the long run inimical to the best interests of Society, and

WHEREAS, the practice, long established, wherein members of professions who are employed in permanent capacities by National, State, County, Municipal and other agencies have not alone engaged in but have actually competed for work outside the duties of their regular positions, is today contributing materially to the reduced or even lack of income, and, in many instances almost destitute condition, of engineers dependent upon private practice for their livelihood, and

WHEREAS, advices from every quarter of the state indicate that professional employees of governmental, public, quasi-public and business agencies are and have been not alone competing with private practitioners, but utilizing, advertently or inadvertently, information, data and materials incidental to the functioning of their offices, in connection with such competition, and

WHEREAS such practice is both unfair and in many instances unethical, now therefore be it

RESOLVED, that the New York State Society of Professional Engineers in meeting assembled at Albany, Feb. 4, 1933, does hereby condemn the practice of professional men engaged as employees of Federal, State, County or Municipal Agencies or of public or quasi-public utilities and corporations, firms or businesses competing as individuals with private practitioners or offering or rendering professional services for fees or other emoluments less than those of legitimate private practitioners, or of using or giving engineering data or materials, entrusted to their keeping, for unfair advantages, and be it also

RESOLVED, that under the existing circumstances the Society does herewith appeal to all engineers at present engaged in gainful occupation providing a living income, and especially to the employees of governmental and utility agencies, to refrain from seeking or accepting engineering or surveying work of a character performed by private practitioners generally and outside of that for which they are regularly employed, and be it further

RESOLVED, that the New York State Society recommends to the several legislative authorities throughout the State that the duties of members of professions, retained as regular employees of the public service be so defined as to make illegal competitive professional practice, and be it finally

RESOLVED, that the Society approves of the procedure and method legally adopted in the Province of Quebec, Canada, and strongly recommends that the Codes of Ethics and Practice of the New York State Society of Professional Engineers and its several chapters be incorporated in the laws regulating the practice of professional engineering and surveying in this State and that violation thereof be made grounds for censure or disbarment from practice. (Adopted).

RESOLUTION

Regarding Certain Proposed Legislation in the State of New York, the Ultimate Aim of Which Wou Be to Increase the Availability to Municipalities of Funds Which the Government Has Authorized for the Relief of Unemployment and for the Creation of Certain Needed Public Works.

As members of a society which, in its first essence, is dedicated to the causes of human welfare and achievement and,

WHEREAS, we are cognizant of the grave plight in which many of our citizens have been placed because of current economic conditions, and

WHEREAS, we are firmly convinced that American workers prefer gainful employment to public or private charity, and

WHEREAS, as engineers, we are aware of the urgent need of many municipalities for sanitary water supplies, safe sewage disposal and other public works to relieve conditions that menace the public health, and

WHEREAS, the United States Government, through its Emergency Relief and Construction Act of 1932, made large sums available by which municipalities can relieve local unemployment through job giving on public works of a self-supporting type, and

WHEREAS, Senate Bill No. 450, Int. 444; and Senate Bill 451, Int. 445, introduced in the Senate of the State

of New York by Senator Thomas C. Desmond of the 27th District, would open the legal way for municipalities to gain such loans, and

WHEREAS, provision is made in Senate Bill No. 450, for authorizing cities and towns of the state to construct, own, operate, maintain and improve public works for the treatment of sewage, and

FURTHER authorizes charges for use of such services as these works may provide, and

FURTHER authorizes the municipalities to issue revenue bonds, payable from the revenues of such works, and

FURTHER authorizes contracts for the sale of such services as the works may provide to other municipalities, and

WHEREAS, provision is made in Senate Bill No. 451 for the authorization of waterworks projects along similar lines, and

WHEREAS, the passage of these acts is vital to enable our municipalities to qualify for loans administered by the Reconstruction Finance Corporation, be it therefore

RESOLVED, that we, the New York State Society of Professional Engineers, in meeting asembled at Albany, Feb. 4, 1933, do hereby petition and request the members of the Legislature of the State of New York to give serious attention to, and to pass with all possible expediency, Senate Bills Nos. 450 and 451, and Assembly Bills of a similar nature, for the speedy relief of the state's unemployed, and for the safeguarding of our citizens. (Adopted).

RESOLUTION
Diversion of State Highway Funds

WHEREAS, during the year 1932, many millions of dollars derived from State gasoline and motor vehicle taxes were diverted by the Legislature to expenditures other than the construction and maintenance of State highways, for which purpose such taxes are levied and their allotment specified by law, and

WHEREAS, the budget for the State of New York for the year 1933, now before the legislature for consideration and adoption will, as presented, divert many more millions of dollars, derived from the same source, from highway work to "other purposes," and

WHEREAS, such diversion of gasoline and motor vehicle tax funds to other than highway purposes will defeat the precise purpose for which they were levied, will deprive the people of the State of the constructive benefits to which they are entitled and will further result in the loss of employment to thousands of men heretofore dependent upon highway construction for a livelihood, including perhaps a thousand members of the engineering profession alone, therefore be it

RESOLVED, that the New York State Society of Professional Engineers, Inc., in meeting assmbled at Albany, Feb. 4, 1933, does hereby register protest against the diversion, proposed in the budget for 1933, of funds derived from gasoline and motor vehicle taxes to any purpose other than the construction, reconstruction, maintenance and repair of State highways and bridges and in so doing, reiterates the fact that any such diversion is contrary to law, and be it also

RESOLVED, that the Society urges prompt legislation providing appropriations in sufficient amount to make possible a normal program of highway construction as a direct and effective means of statewide unemployment relief, and be it also

RESOLVED, that copies of this resolution be sent to Gov. Herbert H. Lehman, Director of the Budget Mark Graves, the Hon. J. J. Dunnigan, Majority Leader, and the Hon. George R. Fearon, Minority Leader of the Senate, and the Hon. Joseph McGinnies, Speaker of the House. (Adopted).

RESOLUTION
Regarding Planning and Zoning

WHEREAS, the lack of planning is conducive to problems and results preventive of full, adequate and proper development of communities, whether large or small, and

WHEREAS, there had arisen, as a result of lack of or inadequate professional planning and of proper regulation, countless controversies and conditions costly and inimical to the best interests of state, county, city and public generally, and

WHEREAS, planning without the services of professional experts is in most, if not all, instances not alone costly but conducive to deplorable and often irremedial conditions, and

WHEREAS, in instances where planning has to a degree been executed the lack of control thereof has resulted in individual and community programs designed to serve restricted interests only, now therefore be it

RESOLVED, that the New York State Society of Professional Engineers in meeting assembled in Albany, Feb. 4, 1933, does hereby recommend to all communities the necessity for properly constituted planning agencies, and be it also

RESOLVED, that the Society does herewith petition the legislature of the State of New York to effect legislation enabling all cities, towns, villages and other communities to create agencies for planning and zoning purposes, and be it further.

RESOLVED, that the said legislation provide: 1st., for the creation of a state agency, possessed of power only to arbitrate conflicting programs sponsored by contiguous communities; and, 2nd., that in all instances planning and zoning agencies shall consist of not less than three members, of whom at least one shall be a professional engineer. (Adopted).

RESOLUTION
Federal Department of Public Works

RESOLVED, that the New York State Society of Professional Engineers strongly urges the formation of a cabinet office in the Federal Government to be known as the Department of Public Works, combining and co-ordinating all work in connection with the investigations, reports, surveys, design and construction of all Public Works except those necessary to the military establishment. Federal Highways, Waterways, Bridges, Harbors, Reclamation Projects, Buildings and other structures as well as all surveys, should be entirely under the control of this department, and be it also

RESOLVED, that the Society appoint through its President, a committee, to study the proposed reorganization and report to the Society on its recommendation, and be it further

Resolved, that the Society notify President Hoover, President-elect Roosevelt, and the New York State Senators and Congressmen of the sense of this resolution and the Society's willingness to assist in this matter in every way. (Adopted).

RESOLUTION
Topographical Survey of the United States

WHEREAS, among the professions of the United States, that of engineering has been most adversely affected by economic conditions, and

WHEREAS, much work that can be profitably performed by engineers and technical men has not been done in the past on account of the press of construction activities, be it hereby

RESOLVED, that the New York State Society of Professional Engineers shall petition the Honorable Senator Robert Wagner of New York to request the Congress of the United States to provide appropriation to permit the completion of the topographical survey of the United States. (Adopted).

RESOLUTION
Board of Trustees

BE IT RESOLVED, that the Constitution and By-Laws of the New York State Society of Professional Engineers be amended to provide for the establishment of a "Board of Trustees" or an "Advisory Board" to consist of the President and all Past Presidents whose duty it shall be to act as an advisory board on the matters pertaining to the welfare of the Professional Engineer and perform such other duties relating thereto.

Referred to Constitution Committee.

* * *

A resolution drawn with a view to requiring all contractors engaged in public works to give evidence of professional engineering personal in other organizations evoked much discussion and was eventually tabled.

The nominating committee consists of D. B. Steinman, New York; F. X. Bode, Albany; Charles J. Sullivan, Rensselaer; W. F. Kavanaugh, Onondaga, and Geo. A. Teeling of Monroe. The committee will select its own chairman. Any recommendations should be forwarded either to the members direct or to the State Society, attention of Nominating Committee.

The Hon. Charles S. Owen, Mayor of Rochester, cordially invited the Society to hold its next meeting in that city.

The meeting was one of the most interesting and pleasant gatherings that the Society has to record. The general committee, directed by Mr. Fred Zurmuhlen of Richmond, and the various special committees appointed by Albany Chapter and headed by Mr. Thos. Devane, merit the recognition and appreciation that was expressed by resolution. From every angle, not the least of which might be recorded under the title of sociability, the occasion was a most successful one and productive of a cordiality and co-operation that is one of the principal causes of the development and the continued expansion of the Society. To all who collaborated the Society, through the medium of The American Engineer, offers its sincere congratulations.

Engineer Versus Scientist

(Continued from Page 17)

The best talent is not only available to the largest theatre, but to the smallest as well.

A further development is the advent of talking movies in the home. Not only can pictures of events be taken, but the sound effects as well, can be duly recorded.

The advanced methods employed for recording sound by engineers, is responsible for rehabilitation of our well known phonograph. The advent of radio seemed to spell the doom of this common home amusement and educational device, but the application of new electrical and radio principles has resulted in a decided improvement and has given it a new lease on life.

Thus, thru engineering versatility, discoveries in one field are quickly adapted to other fields and the public reaps the benefits.

With the coming of sound, in all its possibilities, to the motion picture theatre, a premium was placed on technique in acting and many of the best stage stars are now features in the talkies.

The equipment necessary for a theatre to stage talking pictures is costly. Despite this, nearly three quarters of the theatres in the world are now showing sound pictures. The electrical recording of phonograph records brings to us the great bands, orchestras and musicians of the world at small cost.

Talking travelogue pictures bring us, in sound, far distant scenes and peoples and are a distinct educational factor.

More credit to the engineer's achievements, his efforts and progress are a marvel to behold.

The application of radio principles to musical instruments has given us entirely new and revolutionary devices of an unheard of range. Our new pipe organs are more easily operated and are capable of reproducing any orchestral creation or effect. Then, too, instruments have been developed for light symphonies instead of sound-music in light of constantly changing color and frequency. A new musical instrument of wide range and pure tone, the Thermin, has recently been introduced. In playing this istrument the musician does not have any physical contact with any part of it. At a recent symphony concert in New York City, all the instruments used were of this nature.

Engineers have operated on the pipe organ, removed its pipes and substituted vacuum tubes and other radio devices resulting in increased range, purer tone and greater volume.

The advent of bloodless surgery, in which vacuum tubes are employed for energizing an electronic knife, is a marvelous advance in the surgical field. This so-called Radio-knife, not only eliminates danger from hemorrhage and lessens possibility of infection, but reduces post operative shock to the patient. Many operations formerly considered too delicate or dangerous are now being performed with this new device.

The development of the X-ray has given us a new curative agent in our fight against cancer. Powerful X-ray tubes are now capable of giving us substitute for the hard penetrating Gamma rays of radium. We are all more or less familiar with the usefulness of X-ray and the certainty which it has introduced into the medical and surgical diagnosis.

Further applications of engineering achievements to medicine have given us artificial sunlight: infra red rays for the treatment of deep seated pain; and ultra violet rays with their germ killing and actinnic properties. Thus, the physician is greatly aided in the treatment of pneumonia, tuberculosis, common colds and deep seated conditions where endothermy or internal heating is beneficial.

While ten years of endeavor by engineers in the automotive field has produced a few major changes of importance, gradual improvement and refinement has been the keynote. However, the automobile of 1922 cannot be compared in performance, riding qualities, or luxuries with our present day cars.

In the field of aeronautics, we find many examples of advances in engineering practice. The aeroplane has been strengthened thru improved design and the devolopment of strong light weight alloys. Refinement in motors has helped increase our speeds, until today swift pursuit planes are capable of better than six miles per minute. Multi-motored transport planes of today are able to carry heavier loads over greater distances and in less time than was thought possible a few years ago.

The dirigible type of air craft has come to the front in late years. Here, too, the development of strong light weight alloys has played an important part, permitting the building of larger and stronger craft. All of us are familiar with the memorable flights of the Graf Zeppelin and even larger ships of the type will soon be plying across seas and deserts.

During late years, the railroads have been rather hard pressed by the ever increasing use of other means of transportation. However, decided improvements in rolling stock and equipment are noticeable. Many railroad lines have completed the installation of modern block signals and interlocking safety devices. Some few have partially electrified their systems. Others, since the development of new power converting vacuum tubes, are considering such steps.

Engineering research and design have developed the Deisel engine to a point where it furnishes an economical power unit for the driving of ocean liners and battleships, as well as acting as a prime mover. Recent developments in the Deisel engine field have rendered it a practical engine for aeroplane use. Its weight has been reduced to such extent that its power output, weight for weight, is comparable with the gasoline or other types of internal combustion engine. The kind of fuel used, in addition to the cheapness, reduces the fire hazard—one of the principle factors of danger in aerial navigation. The elimination of the electrical ignition system makes it much more dependable than other forms of internal combustion engines.

I understand that a new achievement of engineering is the use of mercury in place of water in boilers, thereby increasing the thermal efficiency to such an extent as to be almost revolutionary.

Another great engineering stride has been taken in the development of an internal combustion type of engine that uses water as its principal fuel.

In industrial chemistry too, the engineer has made enormous progress. Many new industries have come into being and others have been changed radically by his discoveries. For example, the coal tar dye industry has been born and grown to colossal proportions. Practically all of our present day dye stuffs are produced from coal. Most of our ladies perfumes have the same origin. From the chemical engineers, come many new pharmaceutical agents of material benefit to physicians. We no longer have to depend on the nitrate beds of Chile for nitrates necessary in the manufacture of explosives, fertilizer, etc. Our engineers have shown us how to obtain it from the air by the fixation of nitrogen into cyanamide. The Muscle Shoals project was started by the Government during the war, for this specific purpose.

Artificial silk has been developed and improved to such an extent that its extensive use perils the natural product.

Helium has been made available in commercial quantities at but a fraction of its former cost and its use in dirigible type aircraft has precluded the hazards of fire and explosion.

New explosives of terrific power and gases of poisonous and deadly nature have put mighty defense and offense weapons in our hands.

The development of many new and improved food stuffs, articles of clothing and safeguards to our health is attributable to the skill and tenacity of the chemical engineering profession.

* * *

Chapter News

(Continued from Page 13)

Publicity—W. J. Massa, chairman, J. C. Wolfe, George Wardlaw; Membership—E. A. Verpillot, Chairman; H. B. Loomis, J. C. Lutkenhouse; Legislation—V. H. Reichelt, Chairman, W. J. Noonan, George Reeder; House—W. E. Pettigrew, Chairman, F. H. Conley, N. Nielson; Finance—J. A. Pietsch, Chairman, R. J. Werner, J. L. Susserott; Professional Ethics—W. V. Barnes, Chairman, C. E. Olsen, George T. Allison.

The following special Zoning Committee was appointed; George T. Allison, Chairman, Charles Strohmeyer, J. A. Pietsch, Algernon B. Comins, Max Freund.

Richmond County (Staten Island) has been handicapped in its development because of its separation from the Borough of Manhattan—the heart and center of the great city—and, in a lesser degree, from the Borough of Brooklyn, the most populous of the boroughs of New York. The problem of overcoming this disadvantage has long agitated the people of Richmond. Counsels and proposals (not all of them disinterested) were many and conflicting—there was discord in the house of Richmond.

The Chapter, shortly after its organization, addressed itself to the task of solving this problem. It made

an exhaustive study of the transit needs of the county, and of the ways and means of meeting those needs. The results of this study, together with recommendations based upon them, were embodied in an attractively printed report which was circulated among the reputable organizations of the county.

The report received spontaneous and universal approval. Its evident careful preparation and its authoritative discussion of the problem engendered confidence. Its manifest disinterestedness acted as a solvent in which all differences were composed. Contentions were forgotten and reputable organized groups, of all shades of opinion on the subject—112 in all—coalesced under the beneficient influence of this organization of trained and public spirited professional men to form the Richmond County Transit Conference. The President of the Chapter, Frederick H. Zurmuhlen, was elected to the presidency of the Conference.

The Conference, after a check analysis of the report and findings of the Chapter, unanimously approved the recommendations of the Chapter and through the good offices of Hon. John A. Lynch, President of the Borough of Richmond, submitted them for the consideration of the Board of Estimate and Apportionment by which they were referred to the Board of Transportation.

Under the baleful influence of the depression, appropriations for public improvements were curtailed and the recommendations so hopefully advanced languished and threatened to descend into the limbo of forgotten things. But the Conference and Chapter were not easily repulsed. A new agency had been created by the Federal Government—the Reconstruction Finance Corporation—with power to grant loans for public works of a self-liquidating character. Recourse to this agency was decided upon.

The interest of Hon. Robert Wagner, U. S. Senator, and Congressman Anning S. Prall (11th Congressional District) in the project was secured and through the use of their good offices a hearing was arranged for Richmond's spokesmen before the Board of Directors of the Corporation. Frederick H. Zurmuhlen, President of the Conference and Chapter, and Herman H. Ordeman, Chairman of the Public Relations Committee of the Chapter. were selected as Richmond's representatives. They journeyed to Washington and advocated the construction of a rapid transit subway system connecting the counties of Richmond, Kings and New York with an intraborough loop on Staten Island itself. Carefully prepared analysis of costs and income were presented to establish the self-liquidating character of the project. The case was so ably pleaded as to win the compliments of Senator Wagner. The presentation was favorably received by the Board, and Hon. Harvey C. Couch, President of the Board of Directors, promised full consideration of the project.

Assistance from the Corporation to finance this great public undertaking can be secured only upon formal application by the government of the city of New York. And Richmond's Conference and Chapter have paved the way for the expeditious approval of such an application should the policy of the City permit it being made. Advantage, however, will be taken of every favoring circumstance and the project advanced to a successful conclusion by the Conference and Chapter of Richmond.

This is but one of the activities which Richmond County Chapter has completed or is engaged in; they have all been recorded in past issues of The American Engineer and are worthy of study and emulation by all Chapters throughout the State.

Mr. Frederick H. Zurmuhlen has just been re-elected to the presidency of his Chapter for his fourth consecutive term—a signal honor well won by inspiring leadership in the important advances which his Chapter has made. Heartiest felicitations are extended to the officers and committee men so recently honored by election and appointment. And may Richmond County Chapter flourish and continue to bring forth good fruit of high accomplishment in increasing abundance.

RAPHAEL J. SMYTH,
Chairman, Committee on
Chapter Activities.

* * *

A Study of the Registration Laws of Other Professions

(Continued from Page 15)

"Each registered physician receiving this list is requested to report to the *secretary of the board and to the secretary* of any duly incorporated *county medical society* existing in the county of his residence or to the secretary of any incorporated *state medical society* in which said county medical society is represented the name and address of any person known to be practicing medicine whose name does not appear in this registry."

None of the Professions in this country has established as complete legal recognition of the local Professional organizations as the Engineering Profession in Canada. There the Provincial societies of Professional Engineers are vested with the administration of the registration laws and the regulation of professional admission and practice. In British Columbia, for example, the entire program of selection, guidance, training, examination, and certification for admission into the Engineering Profession is administered by *"The Engineering Profession in British Columbia"* (the official designation of The Association of Professional Engineers of the Province of B. C.) "Founded by Special Act of the Legislature to administer the terms of 'The Engineering Profession Act' of B. C., being Chapter 108, 1920, of the Provincial Statutes and Chapter 79, 1924, Revised Statutes and Amendments." In Quebec, the corresponding organization named in the law is the "Corporation of Professional Engineers of the Province of Quebec."

(Concluded in the Next Issue)

* * *

What the New York State Society is Doing

(Continued from Page 16)

committee is an able one. George W. Allison, a civil engineer, is chairman; and the membership includes A. B. Cummings of the Building Bureau, who will provide valuable co-operation from Borough Hall.

There is no question that a comprehensive investigation of the zoning ordinances is needed. Already there have been a number of conflicts on Staten Island, with home-owners pitted against apartment house builders, gas station operators and poultry market proprietors. The only way to safeguard the rights of every class is to define them wisely and clearly. Where changes in existing ordinances are needed, they should be weighed and approved.

The committee's task is a sweeping one. It will probably require at least a year. Staten Island is lucky in having a group of citizen experts who will undertake such a job with no hope of reward except the satisfaction of steering their borough's growth in the right direction.

ENGINEERS PROTEST PERSONNEL REDUCTION

(From the Scarsdale Inquirer)

Protests were registered last week by the Westchester County Chapter of the New York State Society of Professional Engineers against the reduction of engineers employed by the county and municipalities. It was stated that the engineering departments have been called upon to bear a disproportionate share of the personnel reductions.

Note: Lack of space prevents additional reproductions.

During the last ten days the office of this publication has been literally swamped with press reports and clippings collected by the Society and its Publicity Committee from every corner of the State. This is a most convincing response to those who wish to replace the Society with an Engineering Council composed of irreconcilable and heterogeneous groups. To attempt such a thing in New York is, at this time, an intolerable act which can only be looked upon as an effort to prevent the New York State Society from bringing about the proper recognition of the profession and the individual engineer in this state.

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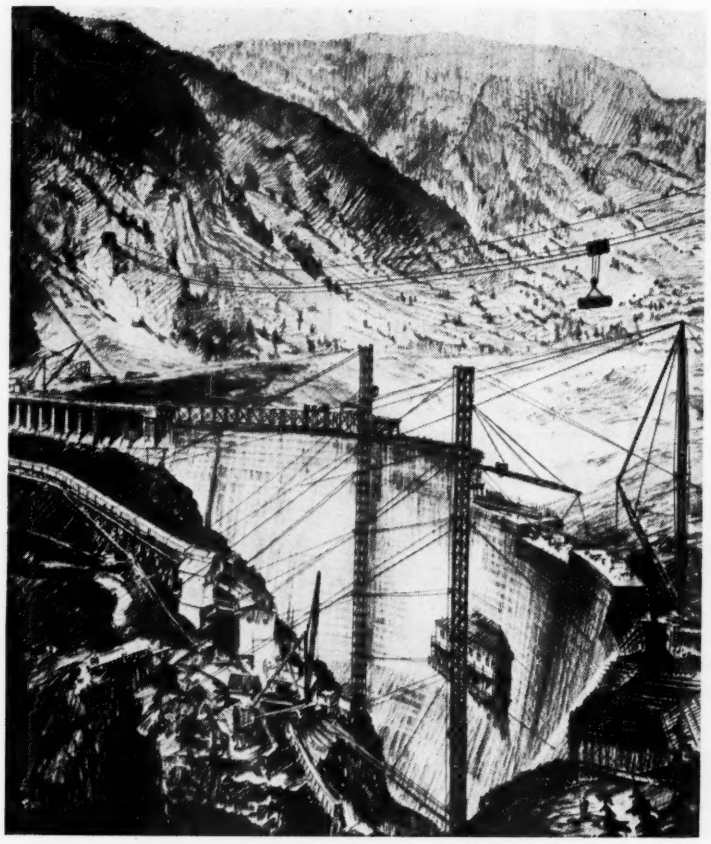

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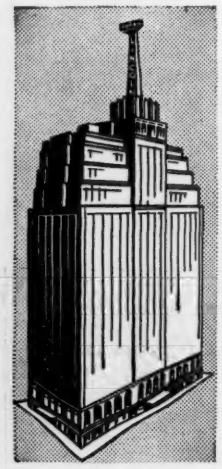

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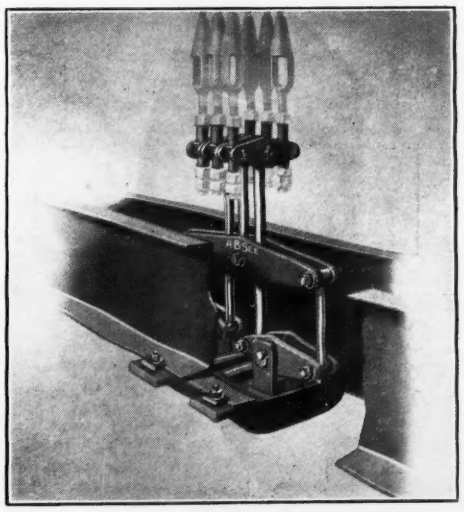

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THE HART, COOLEY, HIGHTON CO.

Announces the New Complete Line of

H-C-H

CONVECTION HEATERS

The Hart & Cooley Mfg. Co., and its Wm. Highton & Sons Division have been active participants in the heating trade for thirty years. The Hart & Hutchinson Co., has behind it many years' experience in metal cabinet work. The Hart, Cooley, Highton Co., combines these factors in producing a line of Convection Heaters.

Over six years was spent in experimental work and laboratory tests before formally announcing this complete line of Convection Heaters. Efficiency and durability were the prime considerations in designing the heating element and in every point of construction these features figure prominently. The outstanding points are:— all-copper heating element, multi-tube construction with a minimum of four tubes per unit, and all welded connections.

The enclosures have also been given careful study and are designed to meet every condition. The complete line includes two styles of both plastered in and plate type enclosures, as well as a semi-recessed model, and two cabinet designs, free standing and wall hung. A wide choice in grille designs assures harmony with any style of interior decoration.

For complete information send for catalogue No. 33-C.

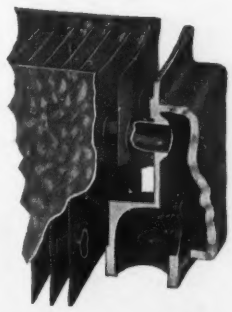
THE HART, COOLEY, HIGHTON CO.

New Britain H-C-H **Connecticut**

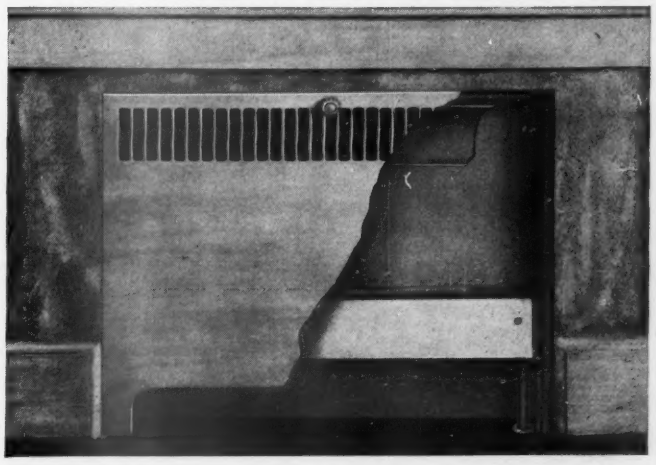
New York Office—101 Park Avenue

TELEPHONE: CAledonia 5-3842

Cutaway view of H-C-H Type R Convector showing stack, or lining, heating element, and front with damper. The feature of this type is a plaster lock frame into which the front fits, making the face of the front flush with the plaster line.



Cutaway view of heating element illustrating multi-tube construction and heavy cast bronze header into which the tubes are welded.



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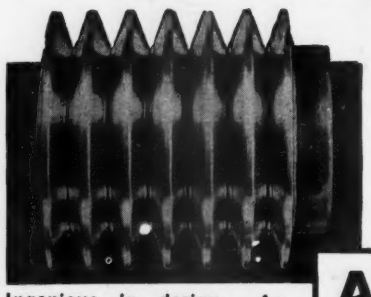

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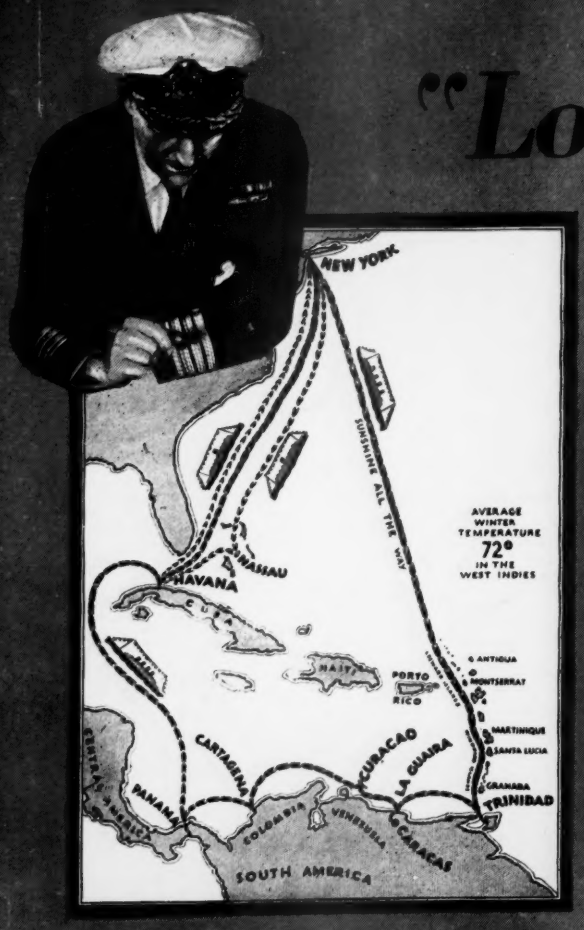

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